AGFA HEALTHCARE
DICOM Conformance Statement

AGFA HealthCare Enterprise Imaging 8.3.x

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1 CONFORMANCE STATEMENT OVERVIEW

This document is a DICOM Conformance Statement for the DICOM Services of the Agfa HealthCare Enterprise Imaging 8.3.x further referred to as Enterprise Imaging.

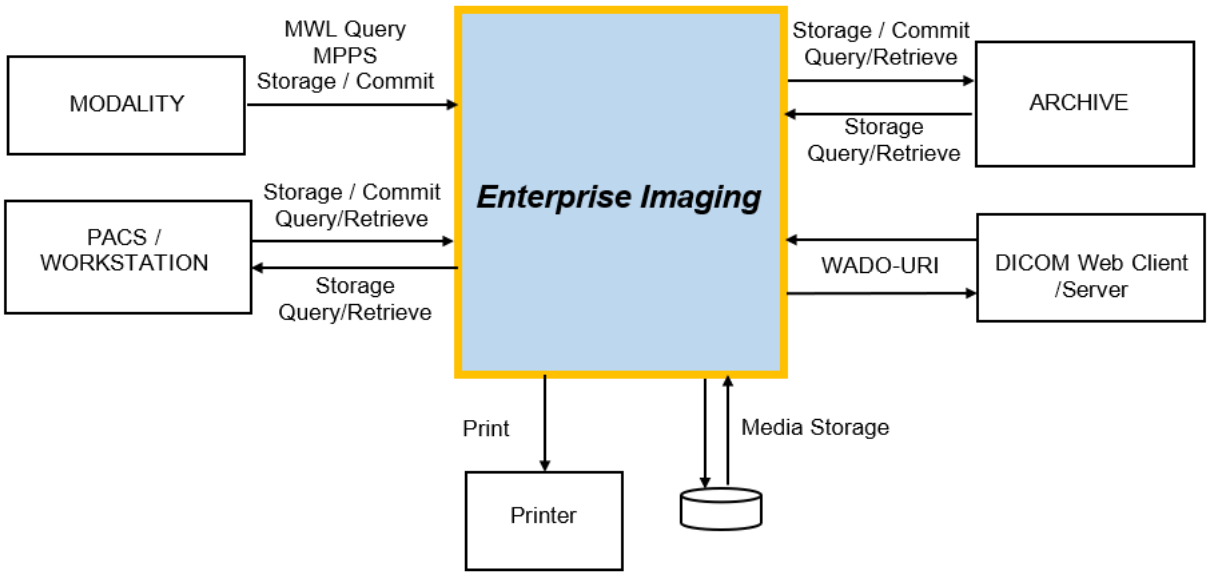
Enterprise Imaging is comprised of several components that each provide certain DICOM capabilities conforming to the DICOM 3.0 2023 standard.

The following are the application entities (AE) that implement DICOM services in Enterprise Imaging:

- Enterprise Imaging Core Server AE (Display part being Diagnostic/ Acquisition / Clinician desktops)
- Enterprise Imaging Core Server Print AE (used for DICOM print)
- Enterprise Imaging Web Server AE (Display part being XERO Viewer and XERO Workflow)

Enterprise Imaging acts as a service class provider (SCP) for Verification, Storage, Storage Commitment, Query/Retrieve, Modality Worklist and Modality Performed Procedure Step SOP Classes. It also acts as a DICOM Web Origin Server for WADO-URI

Enterprise Imaging acts as a service class user (SCU) for Verification, Storage, Storage Commitment, Query/Retrieve, Modality Worklist and Print SOP Classes. It also acts as DICOM Web User Agent for WADO-URI



1.1 Content and Transfer

Table 1-1 lists all Storage SOP Classes and the supported transfer mechanisms as well as the usage scenarios for those instances.

The "Transfer Syntax Set" column lists the sets of Transfer Syntaxes defined in

Table 1-2 that are applicable to each SOP Class. The "DIMSE", "DICOM Web" and "Media Services" columns indicate the roles supported for each SOP Class.

The "Function" columns indicate how the instances are used by the system:

- Create: The system creates instances of the SOP Class. The type of the created SOP Class is indicated by one of the following abbreviations:
  - S: Standard SOP Class
  - SE: Standard Extended SOP Class
  - SP: Specialized SOP Class
  - P: Private SOP Class
- Display: The system displays the instances of the SOP Class to the user, either by displaying the SOP Instances natively or by applying instances of another suitable SOP Class to the image instances (e.g., a Presentation State or CAD SR).
- Process: The system processes the instances of the SOP Class to derive some further information that is made available to the user (e.g., a CAD processing algorithm, or a 3D Rendering).
- Archive: The system stores the instances of the SOP Class and makes them available again.

Table 1-1 Storage SOP Classes

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Media Storage Directory Storage	1.2.840.10008.1.3.10	NI	N	N	N	N	Y	N	Y	S	N	Y	N
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	NI	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	NI	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	NI	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	NI	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	NI	Y	Y	Y	Y	Y	N	Y	S[2]	Y[1]	N	Y
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	NI	Y	Y	Y	Y	Y	N	Y	S[3]	Y	N	Y
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	NI	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	NI	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
XA / XRF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y

[1] XERO Viewer only
[2] XERO Capture only – Used for Upload Audio files (WAV, FLAC, AIFF, MP3)
[3] Core Server only

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Intravascular Optical Coherence Tomography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.14.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
Intravascular Optical Coherence Tomography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.14.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	NI	Y	Y	Y	Y	Y	N	Y	S[4]	Y[4]	N	Y
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	NI	Y	Y	Y	Y	Y	N	Y	S[5]	Y[6]	N	Y
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y

[4] XERO Capture only – Used for upload and display of encapsulated documents (Word, Excel, PPT etc.).
[5] WIP
[6] Display of Segmentation created by the Core server only - WIP

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	V	Y	Y	Y	Y	Y	N	Y	N	Y[7]	N	Y
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	V	Y	Y	Y	Y	Y	N	Y	N	Y[7]	N	Y
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y[1]	N	Y
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	U; LL; L	Y	Y	Y	Y	Y	N	Y	Y[8]	Y	N	Y
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	V	Y	Y	Y	Y	Y	N	Y	Y[9]	Y[7]	N	Y
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	V; U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y

[7] EI Desktops cannot display video with MPEG-4 and MPEG-2 High Level transfer syntaxes
[8] XERO Capture only – Used for upload and display of images (JPG, PNG)
[9] XERO Capture only – Used for upload and display of video (MPEG2, MPEG-4)

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Spectable Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Macular Grid Thickness and Volume Report Storage	1.2.840.10008.5.1.4.1.1.79.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	NI	Y	Y	Y	Y	Y	N	Y	See Table 1-3			Y
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	NI	Y	Y	Y	Y	Y	N	Y	See Table 1-3			Y
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	NI	Y	Y	Y	Y	Y	N	Y	See Table 1-3			Y
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	NI	Y	Y	Y	Y	Y	N	Y	See Table 1-3			Y
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	NI	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	NI	Y	Y	Y	Y	Y	N	Y	See Table 1-3			Y
Colon CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.69	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Implantation Plan SR Storage	1.2.840.10008.5.1.4.1.1.88.70	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	NI	Y	Y	Y	Y	Y	N	Y	Y[10]	Y	N	Y

[10] Core Server for Conversion of Validated report into DICOM Encapsulated PDF - XERO Capture for upload and display of PDF documents

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	UID		SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	NI	Y	Y	Y	Y	Y	N	Y	N	Y[11]	N	Y
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
PRIVATE SOP Classes													
Dcm4che Encapsulated Document Storage	1.2.40.0.13.1.5.1.4.1.1.104.1	NI	N	N	N	N	N	N	N	N	N	N	N
Agfa Basic Attribute Presentation State	1.2.124.113532.3500.7	NI	N	N	N	N	N	N	N	N	N	N	N
Toshiba Private US Data Storage	1.2.392.200036.9116.7.8.1.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
GE Private DICOM 3D Object	1.2.840.113619.4.26	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
GE Private PET Raw Data Storage	1.2.840.113619.4.30	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Siemens CSA Non-Image Storage	1.3.12.2.1107.5.9.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y

[11] XERO Viewer only

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
Name	**UID**		**SCU**	**SCP**	**UA**	**OS**	**FSC**	**FSU**	**FSR**	**Create**	**Display**	**Process**	**Archive**
Philips 3D Private Presentation State Storage	1.3.46.670589.2.5.1.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Philips Private MR Examcard Data Storage	1.3.46.670589.11.0.0.12.4	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Retired SOP Classes													
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	NI	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	U; LL; L	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	NI	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y

Table 1-2 Supported Transfer Syntaxes

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type - WIP
	JPEG Process 14, lossless, Non-Hierarchical	1.2.840.10008.1.2.4.57	image/jpeg

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type - WIP
Lossless Compressed Transfer Syntax Set (**LL**)	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	image/jpeg
	JPEG-LS Lossless	1.2.840.10008.1.2.4.80	image/jls
	JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	image/jp2
	RLE Lossless	1.2.840.10008.1.2.5	image/dicom-rle
Lossy Compressed Transfer Syntax Set (**L**)	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	image/jpeg
	JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	image/jpeg
	JPEG-LS Lossy (Near-Lossless)	1.2.840.10008.1.2.4.81	image/jls
	JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	image/jp2
Non-Image Transfer Syntax Set (**NI**)	Implicit VR Little Endian	1.2.840.10008.1.2	N/A
	Explicit VR Little Endian	1.2.840.10008.1.2.1	application/octet-stream
	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N/A
	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99	N/A
Uncompressed Transfer Syntax Set (**U**)	Implicit VR Little Endian	1.2.840.10008.1.2	N/A
	Explicit VR Little Endian	1.2.840.10008.1.2.1	application/octet-stream
	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N/A
Video Transfer Syntax Set (**V**)	JPEG Baseline (Process 1)[12]	1.2.840.10008.1.2.4.50	image/jpeg
	MPEG2 Main Profile / Main Level	1.2.840.10008.1.2.4.100	video/mpeg
	MPEG2 Main Profile / High Level[13]	1.2.840.10008.1.2.4.101	video/mpeg
	MPEG-4 AVC/H.264 High Profile / Level 4.1[13]	1.2.840.10008.1.2.4.102	video/mp4
	MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1[13]	1.2.840.10008.1.2.4.103	video/mp4

[12] When Video SOP class is used to transfer single frame or multi-frame images using JPEG Baseline Transfer Syntax, only XERO Viewer can display the images
[13] **MPEG-4 and MPEG2 High Level are supported by Core Server for Storage only. Display is supported in XERO Viewer except for the Level 4.2 2D and Level 4.2 3D transfer syntaxes**

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type - WIP
	MPEG-4 AVC/H.264 High Profile / Level 4.2 For 2D Video[13]	1.2.840.10008.1.2.4.104	video/mp4
	MPEG-4 AVC/H.264 High Profile / Level 4.2 3D Video[13]	1.2.840.10008.1.2.4.105	video/mp4

1.1.1 Structured Reporting Root Template ID's

Table 1-3 lists all Template IDs (TID) of Root Templates that are supported by the system. The "Function" column indicates how the system uses the content of the DICOM SR:

- CREATE: The system creates instances using the specified TID.
- RENDER: The system displays the content of the SR, without using the data for any processing.
- EXTRACT_DATA: The system can extract structured data from the content and use the data for subsequent processing (e.g., reporting).
- OVERLAY: The system uses the information in the SR to display information directly on the images (e.g., Mammography CAD markers).
- ARCHIVE: The system stores instances for later retrieval.

The "SOP Class UID" column indicates which of the SR Storage SOP Classes are used to encode the information or to store it. If multiple SOP Classes are supported, the "Condition" column describes the conditions for using the different SOP Classes.

Table 1-3 Supported Root SR Template IDs (TIDs)

Name	Root TID	Function	SOP Classes		Condition
Measurement Report	1500	RENDER ARCHIVE	Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	
			Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	
Basic Diagnostic Imaging Report	2000	RENDER ARCHIVE	Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	

Name	Root TID	Function	SOP Classes		Condition
Mammography CAD Document Root	4000	OVERLAY ARCHIVE	Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	OVERLAY only supported by Diagnostic Desktop. Not by XERO Viewer
OB-GYN Ultrasound Procedure Report	5000	EXTRACT_DATA ARCHIVE	Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	A set of default fetal development parameters /measurements can be extracted.
Vascular Ultrasound Report	5100	EXTRACT_DATA[14] ARCHIVE	Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	
Echocardiography Procedure Report	5200				
Pediatric, Fetal and Congenital Cardiac Ultrasound Reports	5220				
Projection X-Ray Radiation Dose	10001	RENDER ARCHIVE	X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	
CT Radiation Dose	10011				

[14] Only available with EI for Cardiology License

1.2 DIMSE Services

1.2.1 Verification

Table 1-4 lists support for the Verification SOP Class.

Table 1-4 Verification SOP Class

SOP Classes		Transfer Syntax		SCU	SCP
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y

1.2.2 Storage

For details on supported Storage SOP Classes see Section 1.1

1.2.3 Workflow Management

Table 1-5 lists all supported Workflow Management SOP Classes.

Table 1-5 Workflow Management SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y[15]
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
Instance Availability Notification	1.2.840.10008.5.1.4.33	Implicit VR Little Endian	1.2.840.10008.1.2	N	N[16]

1.2.4 Query/Retrieve

Table 1-6 lists all supported Query/Retrieve SOP Classes.

Table 1-6 Query/Retrieve SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
QUERY SOP Classes					
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y

[15] Core server only
[16] SOP class accepted, but the notifications are not processed by Enterprise Imaging
[17] Retired

SOP Classes		Transfer Syntax		SCU	SCP
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Patient Study Only Query Retrieve Information Model - FIND (Retired)	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Dcm4che StudyRoot - FIND	1.2.40.0.13.1.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	N
Dcm4che Blocked StudyRoot - FIND	1.2.40.0.13.1.5.1.4.1.2.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	N
Agfa Cluster Link Query Information Model - FIND[18]	1.2.124.113532.5.1.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
RETRIEVE SOP Classes					
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	Y[19]	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y[19]	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	Y[15]	Y
Patient Study Only Query Retrieve Information Model - MOVE (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	Y[19]	N[20]
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y[19]	N[20]
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	N[20]
Patient Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Study Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	Y
Composite Instance Retrieve Without Bulk Data - GET	1.2.840.10008.5.1.4.1.2.5.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
Patient Study Only Query Retrieve Information Model - GET (Retired)	1.2.840.10008.5.1.4.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	N	N[21]
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	N[21]

[18] Only used in combination with IMPAX to get the private GPI (Global Patient ID) tag returned
[19] Web Server Only
[20] Association accepted, however, error 0211 (Unrecognized operation) returned when receiving C-MOVE
[21] Association accepted, however, error 0122 (SOP class not supported) returned when receiving the C-GET

SOP Classes		Transfer Syntax		SCU	SCP
		Explicit VR Big Endian[17]	1.2.840.10008.1.2.2	N	N[21]

1.2.5 Printing

Table 1-7 lists all supported Printing SOP Classes.

Table 1-7 Printing SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
Basic Grayscale Print Management Meta	**1.2.840.10008.5.1.1.9**	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
> Basic Film Session	1.2.840.10008.5.1.1.1				
> Basic Film Box	1.2.840.10008.5.1.1.2				
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4				
> Printer SOP Class	1.2.840.10008.5.1.1.16				
Basic Color Print Management Meta	**1.2.840.10008.5.1.1.18**	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
> Basic Film Session SOP Class	1.2.840.10008.5.1.1.1				
> Basic Film Box SOP Class	1.2.840.10008.5.1.1.2				
> Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1				
> Printer SOP Class	1.2.840.10008.5.1.1.16				
Print Job	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	N[22]	N
Basic Annotation Box	1.2.840.10008.5.1.1.15	Implicit VR Little Endian	1.2.840.10008.1.2	N[22]	N
Presentation LUT	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N

1.3 DICOM Web Services

1.3.1 URI Service (WADO-URI)

Table 1-8 lists details on the support of the URI Service.

Table 1-8 URI Service

Service	Transaction	User Agent	Origin Server
URI Web Service (WADO-URI)	Retrieve DICOM Instances	Y[23]	Y
	Retrieve Rendered Instance	Y[23]	Y

For resources supported see Table 1-1 in Section 1.1

1.3.2 Studies Service

Table 1-9 lists details on the support of the Studies Service.

[22] Proposed SOP class in the association, however it is not supported
[23] Web Server only

Table 1-9 Study Service

Service	Transaction	Resource	User Agent	Origin Server
Studies Web Service	Retrieve Capabilities		N	WIP
	Retrieve (WADO-RS)	Study	N	WIP
		Study Metadata	N	WIP
		Study Bulkdata	N	N
		Study Pixel Data	N	N
		Rendered Study	N	WIP
		Study Thumbnail	N	WIP
		Series	N	WIP
		Series Metadata	N	WIP
		Series Bulkdata	N	N
		Series Pixel Data	N	N
		Rendered Series	N	WIP
		Series Thumbnail	N	WIP
		Instance	N	WIP
		Instance Metadata	N	WIP
		Instance Bulkdata	N	N
		Instance Pixel Data	N	N
		Rendered Instance	N	WIP
		Instance Thumbnail	N	WIP
		Frames	N	N
		Rendered Frames	N	WIP
		Frame Thumbnail	N	N
		Bulkdata	N	WIP
	Search (QIDO-RS)	All Studies	N	WIP
		Study's Series	N	WIP
		Study's Instances	N	WIP
		All Series	N	WIP
		Series Instances	N	WIP
		All Instances	N	WIP
	Store (STOW-RS)	All Studies	N	WIP
		Study	N	WIP

1.3.3 Worklist Service – N/A

N/A

1.3.4 Non-Patient Instance Service – N/A

N/A

1.4 Media Services

Table 1-10 lists all supported Media Application Profiles.

Table 1-10 Supported Media Application Profiles

Media Storage Application Profile	FSC	FSR	FSU
Compact Disk – Recordable (Core Server)			
STD-GEN-CD	Y	Y	N
ZIP (Web Server)			
STD-GEN-ZIP-MAIL	Y	N	N
STD-GEN-SEC-ZIP-MAIL	Y	N	N

1.5 Real Time Video Service – N/A

N/A

1.6 De-identification Profiles

The support of de-identification profiles requires the Teach & Research component and License.

Table 1-11 lists all supported de-identification profiles and options.

Table 1-11 De-Identification Profiles

Profile	Option
Basic Application-Level Confidentiality Profile	Clean Pixel Data Option
	Clean Structured Content Option

1.7 Specific Character Sets

Table 1-12 Supported Specific Character Sets

Defined Term	IANA	Description
Single-Byte Character Sets without Code Extensions		
none	ISO-646 or US-ASCII	Default Repertoire (ISO-IR 6)
ISO_IR 13	ISO-IR-13	Japanese
ISO_IR 100	ISO-8859-1	Latin Alphabet No. 1 (Default)

Defined Term	IANA	Description
ISO_IR 101	ISO-8859-2	Latin Alphabet No. 2
ISO_IR 109	ISO-8859-3	Latin Alphabet No. 3
ISO_IR 110	ISO-8859-4	Latin Alphabet No. 4
ISO_IR 126	ISO-8859-7	Greek
ISO_IR 127	ISO-8859-6	Arabic
ISO_IR 138	ISO-8859-8	Hebrew
ISO_IR 144	ISO-8859-5	Cyrillic
ISO_IR 148	ISO-8859-9	Latin Alphabet No. 5
ISO_IR 166	TIS-620	Thai
Single-Byte Character Sets with Code Extension		
ISO 2022 IR 6	ISO 646 or US-ASCII	Default Repertoire (ISO-IR 6)
ISO 2022 IR 13	ISO-2022-JP	Japanese supplementary set
ISO 2022 IR 100	ISO-8859-1	Latin Alphabet No. 1 supplementary set
ISO 2022 IR 101	ISO-8859-2	Latin Alphabet No. 2 supplementary set
ISO 2022 IR 109	ISO-8859-3	Latin Alphabet No. 3 supplementary set
ISO 2022 IR 110	ISO-8859-4	Latin Alphabet No. 4 supplementary set
ISO 2022 IR 126	ISO-8859-7	Greek supplementary set
ISO 2022 IR 127	ISO-8859-6	Arabic supplementary set
ISO 2022 IR 138	ISO-8859-8	Hebrew supplementary set
ISO 2022 IR 144	ISO-8859-5	Cyrillic supplementary set
ISO 2022 IR 148	ISO-8859-9	Latin Alphabet No. 5 supplementary set
ISO 2022-IR 166	TIS-620	Thai supplementary set
Multi-Byte Character Sets without Code Extensions		
GB18030	GB18030	GB18030-2000 (P.R China Norm GB18030)
ISO_IR 192	UTF-8	Unicode in UTF-8
Multi-Byte Character Sets with Code Extensions		

Defined Term	IANA	Description
ISO 2022 IR 87	ISO-2022-JP	Japanese (Supplementary Kanji Set)
ISO 2022 IR 149	ISO-2022-KR	Korean
ISO 2022 IR 159	ISO-2022-JP-2	Japanese

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3 INTRODUCTION

3.1 Revision History

DICOM Conformance Statement Template node ID: 8818332		
Revision Number	**Date**	**Reason for Change**
1.0	January 2007	Final revision
1.1	June 2007	Add table with template node ID of DCS in Revision Record. Minor cosmetic changes
1.2	September 2009	Add Livelink NodeID on front page and in header Add column 'Display' in table 1.1-1: Network Services Supported General layout review
1.3 (16)	December 2009	Update chapter 6.2 Data Dictionary of private attributes Chapter 6.5 Standard Extended / Specialized / Private SOPs Following decision of HCSCT
17-18	June – August 2023	Updated the structure of the DCS to match the new DICOM Standard template (supplement 209) released end of 2022 and documented in DICOM part 2 Annex N

DICOM Conformance Statement Enterprise Imaging			
Revision Number	**Date**	**Product Version(s)**	**Reason for Change**
3	June 2023	8.3.0.000	Initial version for 8.3.0.000 based on template version 16
4-5	October 2023	8.3.1.000	Updated version for 8.3.1.000. nothing changed beside the version number
6-7	December 2023	8.3.2.000	Update for version 8.3.2.000 using the **new DCS template version 18 based on DICOM Supplement 209**. Some sections are still to be completed because the new DCS template version (18) is much more exhaustive than the previous version (16). However, all information (and more) that were in the 8.3.1.000 are included in this version. Removed MWL Worklist SCU support of Web Server since it is for internal use only in conjunction with the Core Server.
8	January 2024	8.3.2.000	Revision for PDF rendering

3.2 Intended Audience of this Document

This document is intended for the audience listed below. It is assumed that the reader has a working knowledge of the DICOM Standard.

The document structure was designed for easier access to relevant information for different user groups:

- Clinical Users, who want to get an overview of the implemented interoperability features of the system can see Section 4 Implementation Model.
- Personnel involved in Sales can use the information in Section 1 to assess the compatibility between different systems involved in a sales situation.
- System Integrators can use information in Section 6 during system installation and also information from Section 5 Service and Interoperability Description for details regarding the implemented services.

- Field Service Engineers can use the details from Section **Error! Reference source not found.** Service and Interoperability Description and from Section 7 Network and Media Communication Details for troubleshooting.
- Hospital IT staff focusing on security can use the details provided in Section 8 Security regarding implemented Security features.
- Research Personnel may be interested in using information provided in Annex A Information Object Definitions (IODs) or Annex **Error! Reference source not found.** Structured Report Content Encoding to get detailed imaging and measurement information

3.3 Remarks

3.3.1 Integration and Validation Activities

The scope of this DICOM Conformance Statement is to facilitate integration between **AGFA HealthCare Enterprise Imaging** and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

- The comparison of Conformance Statements from **AGFA HealthCare Enterprise Imaging** and other DICOM conformant products is the first step towards assessing interconnectivity and interoperability between those systems.
- The responsibility for analyzing the applications requirements and developing a solution that integrates the AGFA HealthCare Enterprise Imaging with other vendors' products is the user's responsibility and should not be underestimated.

  In some circumstances it might be necessary to perform a validation to make sure that functional interoperability between the AGFA HealthCare product and non-AGFA products works as expected. In this case, test procedures should be defined and executed to validate the required level of interoperability with specific DICOM conformant products, as established by the healthcare facility.

  The user should ensure that any non-AGFA provider accepts responsibility for any validation required for their connection with the AGFA HealthCare product.

Enterprise Imaging has participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement of Enterprise Imaging together with the IHE Technical Framework may facilitate the process of validation testing

3.3.2 Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, AGFA HealthCare will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-AGFA provider, who connects with AGFA HealthCare products, also plans for future evolution of the DICOM standard. A refusal to do so may result in the loss of functionality and/or connectivity between the different products.

3.4 Terms and Definitions

The following list includes DICOM Terms, that are used throughout this Conformance Statement:

Abstract Syntax	The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity (AE)	A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities.
Application Entity Title (AET)	The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between Application Entities. Example: DICOM network protocol.
Association	A network communication channel set up between Application Entities.
Attribute	A unit of information in an Information Object Definition; a Data Element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Data Element	A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly
Information Object Definition (IOD)	The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).
Media Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).
Module	A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient' Birth Date, and Patient's Sex.
Negotiation	First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.
Origin Server	Refers to the program that can originate authoritative responses to HTTP requests for a given Target Resource. The term "server" refers to any implementation that receives a web service request message from a user agent.
Presentation Context	The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.
Private SOP Class	A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement.
Protocol Data Unit (PDU)	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.

Service Class Provider (SCP)	Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU)	Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class (SOP Class)	The specification of the network or media transfer (service) of a particular type of data (object) ; the fundamental unit of a DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance (SOP Instance)	An information object; a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image.
Specialized SOP Class	A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes, by enumeration of specific permitted Values for Attributes, or by enumeration of specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes.
Standard SOP Class	A SOP Class defined in the Standard, and that is implemented and used without any modifications.
Standard Extended SOP Class	A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes.
Tag	A 32-bit identifier for a Data Element, represented as a pair of four-digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
Transfer Syntax	The encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation.
TLS-Secured Port	TCP port on which an implementation accepts TLS connections to exchange DICOM information.
Unique Identifier (UID)	A globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
User Agent	A client in a network protocol used in communications within a client-server distributed computing system. In particular, the Hypertext Transfer Protocol (HTTP) identifies the client software originating the request, using a user-agent header, even when the client is not operated by a user.
Value Representation (VR)	The format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Abbreviations

Abbreviations that are used in this DICOM Conformance Statement are listed here.

AE	Application Entity
AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CID	Context Identifier
DCS	DICOM Conformance Statement
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
EI	AGFA HealthCare Enterprise Imaging
ELE	Explicit VR Little Endian
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSPS	Grayscale Softcopy Presentation State
IANA	Internet Assigned Numbers Authority
IHE	Integrating the Healthcare Enterprise
ILE	Implicit VR Little Endian
IOCM	Image Object Change Management (This is an IHE profile)
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standardization
KOSD	Key Object Selection Document
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
N/A	Not Applicable. Meaning it is either not supported or not relevant
NEMA	National Electrical Manufacturers Association
NTP	Network Time Protocol
OID	Object Identifier
OS	Origin Server
PDU	Protocol Data Unit
PHI	Protected Health Information
PPS	Performed Procedure Step

QIDO-RS	Query based on ID for DICOM Objects by RESTful Services
RTV	Real Time Video
SCP	Service Class Provider
SCU	Service Class User
SDP	Service Description Protocol
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
STOW-RS	STore Over the Web by RESTful Services
SUID	Study Instance UID
TBC	To Be Completed - The section is new in the new DCS template and the content will be completed in a future iteration of Enterprise Imaging DCS
TCP/IP	Transmission Control Protocol/Internet Protocol
TID	Template Identifier
UA	User Agent
UI	User Interface
UID	Unique Identifier
UL	Upper Layer
UPS	Unified Procedure Step
UPS-RS	Unified Procedure Step by RESTful Services
VR	Value Representation
WADO-RS	Web Access to DICOM Objects by RESTful Services
WADO-URI	Web Access to DICOM Objects by URI
WIP	Work in Progress (Feature will be supported in a future iteration of EI)

3.6 References

[1] National Electrical Manufacturers Association (NEMA), Rosslyn, VA USA. *PS3 / ISO 12052 Digital Imaging and Communications in Medicine (DICOM) Standard*. http://www.dicomstandard.org .

[2] Integrating the Healthcare Enterprise (IHE). *IHE Radiology Technical Framework*. http://www.ihe.net/Resources/technical_frameworks/#radiology .

4 IMPLEMENTATION MODEL

Enterprise Imaging is a care-centric interoperable, collaborative workflow platform of image management and repository solutions across the continuum of care. It improves physician awareness of a patient's complete imaging record through the EHR and promotes collaboration with other care givers in a multi-disciplinary environment.

Enterprise Imaging has different entry points in the care universe, by offering different solutions, based underneath on the same Consolidated Server Platform.

- Enterprise Imaging offers departmental solutions for different departments: radiology, cardiology, dermatology, ophthalmology, and more multi-specialties. This solution can be offered as a single department solution, span immediately multiple enterprise departments or used as a regional solution to optimize the collaboration and integration in the medical imaging domain.

- Enterprise Imaging offers a Universal viewer (XERO) which can be deployed with the Enterprise Imaging departmental solutions, or which can be deployed with a 3rd party PACS system, or Agfa's IMPAX PACS systems. This offering also gives you the capability to limit the deployment to a Universal viewer deployment, but also be extended to a combined Universal Viewer/departmental solution or a combined Universal Viewer/VNA deployment.

- Enterprise Imaging offers a VNA solution which facilitates vendor neutral, storage agnostic archiving services, extended with workflow management and non-DICOM data, which can be deployed separately or combined with a departmental solution or Universal XERO Viewer.

4.1 Application Entities and Data Flow

The network and media interchange application model for Enterprise Imaging is shown in Figure 4-1 and Figure 4-2 Enterprise Imaging Application Data Flow Diagram.

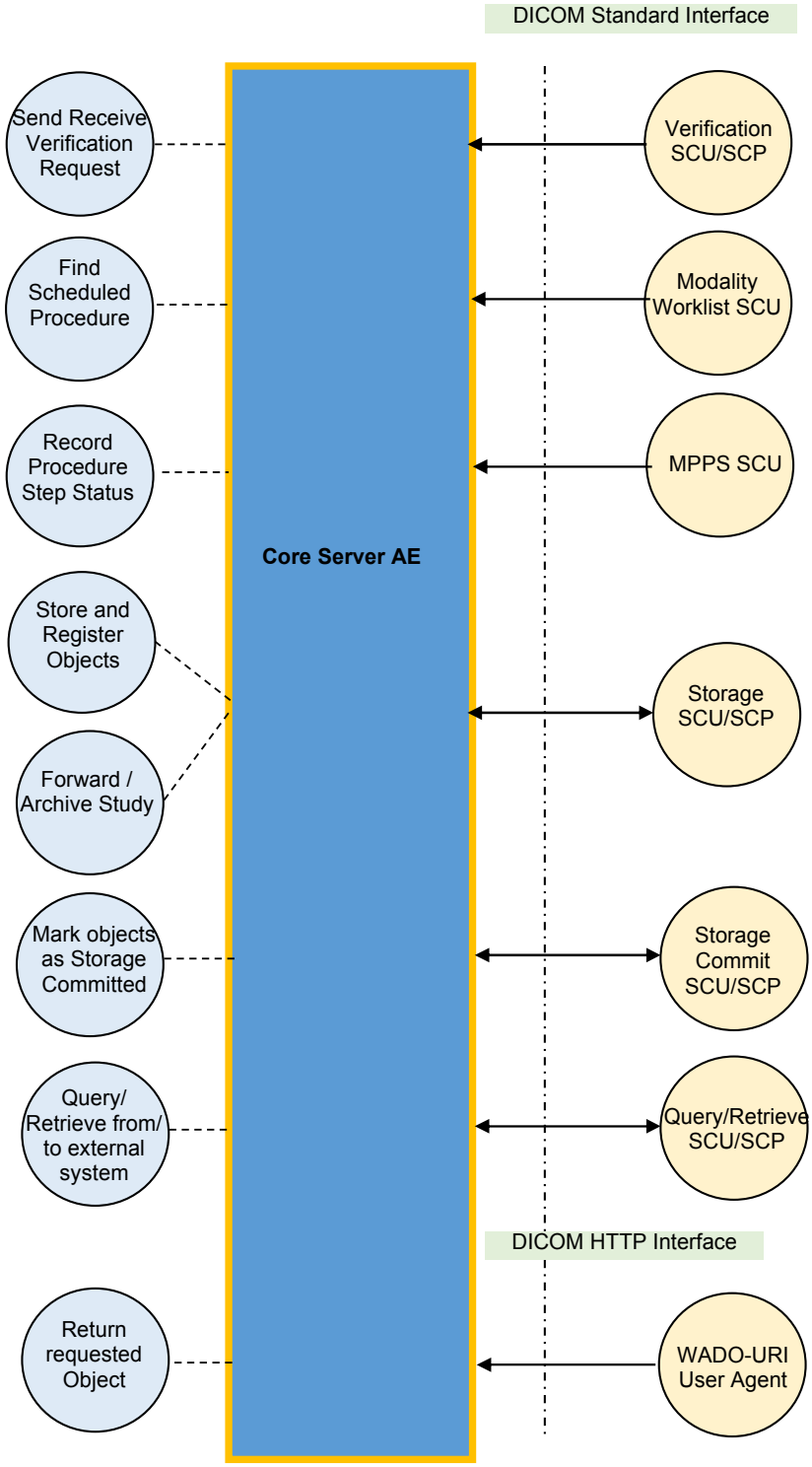

Figure 4-1 Enterprise Imaging Application Data Flow Diagram part 1

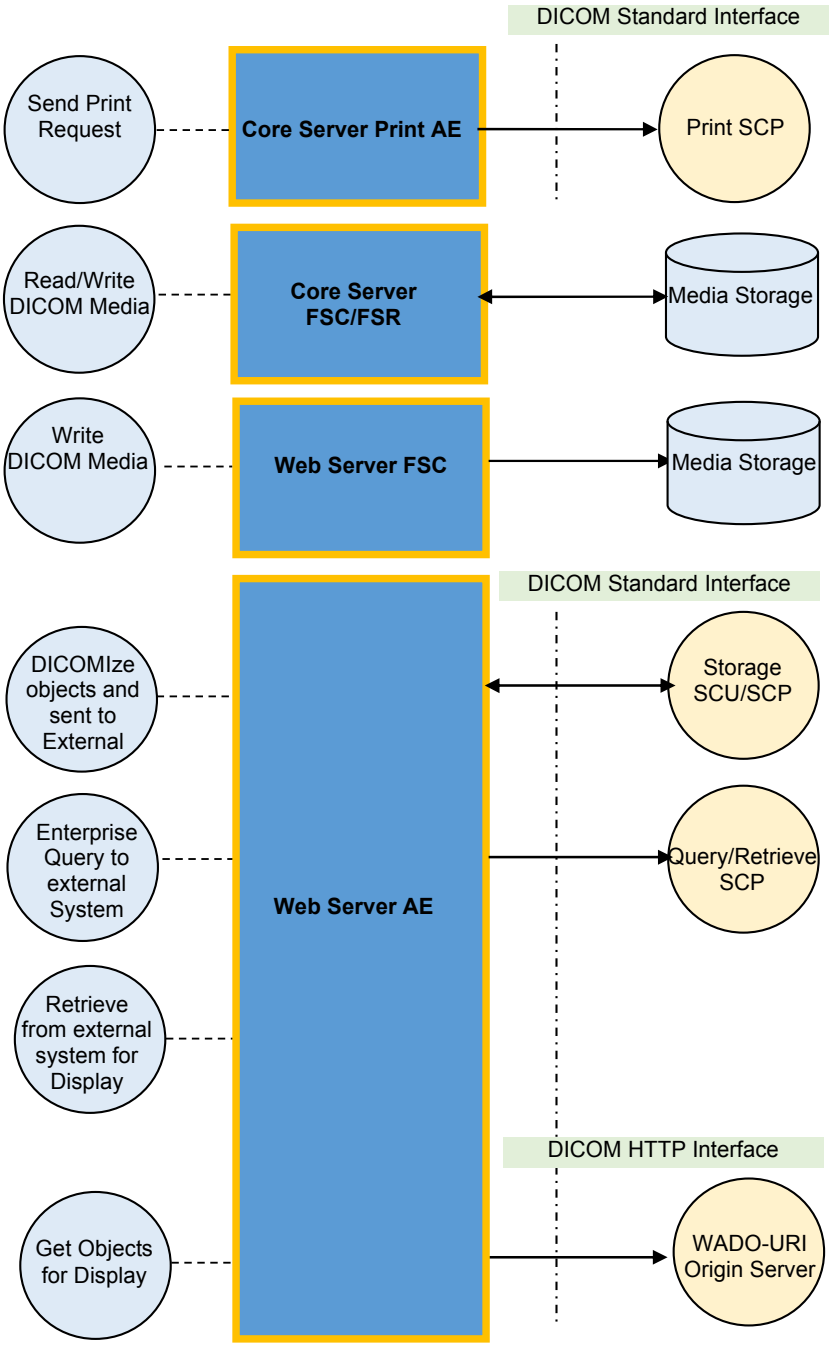

Figure 4-2 Enterprise Imaging Application Data Flow Diagram Part 2

This section describes the organization of the supported Services into Application Entities based on the default configuration of the system. This may change based on the actual setup at the customer site. See Section 6 for details about the configurability of Services into AEs.

4.1.1 Functional Definitions of Core Server AE

Core Server AE can use different AE aliases per major DICOM feature, by default it is configured as a single AE. It provides the following service classes:

4.1.1.1 Verification-SCU

Core Server AE will issue Verification requests in response to UI mediated requests from the user to test the validity of a DICOM connection.

4.1.1.2 Storage-SCU

Core Server AE receives images and stores them to the Storage SCP or to an external Archive Storage SCP, depending on the deployment model.

Core Server AE will also send images to a remote storage SCP once it receives a Retrieve request.

4.1.1.3 Storage Commitment-SCU

Depending on the deployment model, Core Server AE uses store and remember to VNA, as such, it implements the Storage Commitment-SCU to the VNA Storage Commitment-SCP. Core Server AE can also store towards external archive. As such it implements storage commitment-SCU to the external archive Storage Commitment-SCP as well.

4.1.1.4 Query/Retrieve-SCU

Core Server AE Query/Retrieve-SCU act as a Service Class User of C-FIND to query for DICOM objects and C-MOVE to retrieve DICOM objects from an external archive.

4.1.1.5 Verification-SCP

Core Server AE implement the DICOM Verification Service Class as an SCP.

4.1.1.6 Storage Commitment-SCP

Core Server AE acts as Service Class Provider of Storage Commitment to take explicit responsibility for storing DICOM objects received until it archives to the VNA and receives confirmation that VNA has taken over this explicit responsibility.

4.1.1.7 Storage-SCP

Core Server AE stores a received image in its entirety in its internal data store. Enterprise Imaging stores each image with the File Meta Information attached to it. Enterprise Imaging extracts information about the images and stores this information within its internal database.

4.1.1.8 Modality Performed Procedure Step-SCP

Core Server AE acts as a Service Class Provider of MPPS to receive MPPS.

Once it receives a Create (N-CREATE) or an Update / complete(N-SET) request, the Core Server AE will store the MPPS or update an existing MPPS locally.

4.1.1.9 Modality Worklist-SCP

Core Server AE acts as a Service Class Provider of MWL to receive MWL Query.

Once it receives an MWL Query (C-FIND) request, the Core Server AE will search the local database with worklist items that match the query constraints and return the items in the response.

4.1.1.10 Query/Retrieve-SCP and Storage-SCU

Core Server AE responds to queries and retrieves based on the records stored in its database.

Once it receives a Retrieve (MOVE) request, the Core Server AE will initiate a new association and send the requested instances to the Move Destination AE. The new association is handled by the Storage-SCU.

When a remote AE initiates an association with Core Server AE and sends a query (C-FIND) request, Enterprise Imaging will search the database for possible matches with composite SOP instances. The results of the query are returned to the remote AE using the same association.

4.1.2 Functional Definitions of Core Server Print AE

4.1.2.1 Print-SCU

Depending on the selected Image Display Format (or Layout), the Core Server Print AE sends one or more images and Print Management Information to a Remote Application Entity for printing.

At the request of the user of the system Core Server Print AE (SCU) initiates an association with a remote printer AE (SCP) and sends printing requests of a film session with one or more Basic Film Box(es) referring to one or more Basic Image Box(es) to the printer.

4.1.3 Functional Definitions of Web Server AE

4.1.3.1 Verification-SCU

Web Server AE will issue Verification requests in response to UI mediated requests from the user to test the validity of a DICOM connection

4.1.3.2 Storage-SCU

Web Server AE receives uploaded DICOM and non-DICOM format images and converts them to DICOM and sends them to the Core Server storage SCP, or an external PACS storage SCP, depending on the configuration of storage endpoint.

Web Server AE performs, on a web-based move request, a C-STORE to the specified SCP.

4.1.3.3 Query/Retrieve-SCU

Web Server AE act as a Service Class User of C-FIND to query for DICOM objects and C-MOVE to retrieve DICOM objects from an external archive or from Core Server Query/Retrieve SCP.

4.1.3.4 Verification-SCP

Web Server AE implements the DICOM Verification Service Class as an SCP.

4.1.3.5 Storage-SCP

Web Server Storage SCP is always active and primarily used when Web Server initiates a C-MOVE to a remote retrieve SCP. Storage is temporary for the purpose of display and is not queryable or retrievable after the fact through any DICOM SCP services. Web Server can be configured to forward to, for example, to ensure that data is quickly available for display. Also, it can be used as an intermediate destination when a study is being requested from one system which is not DICOM connected to a second system, but where both systems are connected via the Web Server.

Web Server AE Storage-SCP stores a received image in its entirety in its internal data store for viewing. Web Server stores each image with the File Meta Information attached to it.

5 SERVICE AND INTEROPERABILITY DESCRIPTION

5.1 Mapping of Services to Application Entities

Table 5-1 provides an overview of the Application Entities and the Services supported by each AE.

Table 5-1 Service to AE Mapping

Application Entity	Supported Services	Role								
		DIMSE		DICOM Web		DICOM Media			RTV	
		SCU	SCP	User Agent	Origin Server	FSC	FSU	FSR	SCU	SCP
Core Server AE	Verification	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Basic Worklist Management	N	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	MPPS	N	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Storage	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Storage Commitment	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Query/Retrieve	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	URI Web Service (WADO-URI)	N/A	N/A	N	Y	N/A	N/A	N/A	N/A	N/A
	Studies Web Services Retrieve (WADO-RS)	N/A	N/A	N	WIP	N/A	N/A	N/A	N/A	N/A
	Studies Web Services Retrieve (QIDO-RS)	N/A	N/A	N	WIP	N/A	N/A	N/A	N/A	N/A
	Media Storage	N/A	N/A	N/A	N/A	Y	N	Y	N/A	N/A
Core Server Print AE	Print Management	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Web Server AE	Verification	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Storage	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Query/Retrieve	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	URI Web Service (WADO-URI)	N/A	N/A	Y	N	N/A	N/A	N/A	N/A	N/A

5.2 Supported DIMSE Services

5.2.1 Basic Worklist Management Service

5.2.1.1 SCU of the Modality Worklist Information Model - FIND SOP Class – NA

N/A

5.2.1.2 SCP of the Modality Worklist Information Model - FIND SOP Class

As a Service Class Provider of the Modality Worklist Information Model - FIND SOP Class, the **Core Server AE** uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Matching Keys listed in Table 5-2.

In the "Matching Type" column, the following Values can be used:

- SINGLE_VALUE: SCP can perform single Value matching on this Attribute.
- UID: SCP can perform List of UID matching on this Attribute.
- WILDCARD: SCP can perform Wildcard matching on this Attribute.
- RANGE: SCP can perform Range matching on this Attribute.
- SEQUENCE: SCP can perform sequence matching on this Attribute.
- UNIVERSAL: SCP can provide the Attribute in the C-FIND response (i.e., universal matching).

Table 5-2 Supported C-FIND Return Keys for Modality Worklist - SCP

Attribute Name	Tag	Matching Type	Comments
Scheduled Procedure Step			
Schedule Procedure Step Sequence	(0040,0100)	SEQUENCE	
>Scheduled Station AE Title	(0040,0001)	SINGLE_VALUE	
>Scheduled Procedure StepStart Date	(0040, 0002)	RANGE	
>Scheduled Procedure StepStart Time	(0040, 0003)	RANGE	
>Modality	(0008,0060)	SINGLE_VALUE	
>Scheduled Performing Physician's Name	(0040,0006)	WILDCARD	
>Scheduled Procedure Step Description	(0040,0007)	UNIVERSAL	
>Scheduled Station Name	(0040,0010)	UNIVERSAL	
>Scheduled Procedure Step Location	(0040,0011)	UNIVERSAL	
>Scheduled Protocol Code Sequence	(0040,0008)	SEQUENCE	
>>Code Value	(0008,0100)	UNIVERSAL	
>>Coding Scheme Designator	(0008,0102)	UNIVERSAL	
>>Coding Scheme Version	(0008,0103)	UNIVERSAL	
>>Code meaning	(0008,0104)	UNIVERSAL	
>Scheduled Procedure Step ID	(0040,0009)	UNIVERSAL	
>Scheduled Procedure Step Status	(0040,0020)	SINGLE_VALUE	Supported values: (case sensitive) SCHEDULED; ORDERED; STARTED; COMPLETED; CANCELLED; DISCONTINUED. If no value is specified (UNIVERSAL match), only SCHEDULED; ORDERED; STARTED procedure are returned. (Configurable)

Attribute Name	Tag	Matching Type	Comments
Requested Procedure			
Requested Procedure ID	(0040,1001)	SINGLE_VALUE	
Requested Procedure Description	(0032,1060)	UNIVERSAL	
Requested Procedure Code Sequence	(0032,1064)	SEQUENCE	
>>Code Value	(0008,0100)	UNIVERSAL	
>>Coding Scheme Designator	(0008,0102)	UNIVERSAL	
>>Coding Scheme Version	(0008,0103)	UNIVERSAL	
>>Code meaning	(0008,0104)	UNIVERSAL	
Study Instance UID	(0020,000D)	UNIVERSAL	
Referenced Study Sequence	(0008,1110)	SEQUENCE	
>Referenced SOP Class UID	(0008,1150)	UNIVERSAL	
>Referenced SOP Instance UID	(0008,1155)	UNIVERSAL	
Requested Procedure Priority	(0040,1003)	UNIVERSAL	
Imaging Service Request			
Accession Number	(0008,0050)	WILDCARD	
Requesting Physician	(0032,1032)	UNIVERSAL	
Referring Physician's Name	(0008,0090)	UNIVERSAL	
Visit Identification			
Admission ID	(0038,0010)	UNIVERSAL	Returned value is taken from the HL7 field PV1-19.1 (Visit Number).
Visit Status			
Current Patient Location	(0038,0300)	UNIVERSAL	Returned value is taken from the HL7 field PV1-3.1. (point of care). This is the Patient's location department code.
Visit Relationship			
Referenced Patient Sequence	(0008,1120)	SEQUENCE	
>Referenced SOP Class UID	(0008,1150)	UNIVERSAL	Not supported – Tag Always returned with no value.
>Referenced SOP Instance UID	(0008,1155)	UNIVERSAL	Not supported – Tag Always returned with no value
Patient Identification			
Patient's Name	(0010,0010)	WILDCARD	Case insensitive
Patient ID	(0010,0020)	WILDCARD	Case sensitive
Issuer of Patient ID	(0010,0021)	WILDCARD	Only taken into account as matching criteria when a value is present for the Patient ID tag in the MWL Query. (it can be just a wild card '*')
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	SEQUENCE	Tags in the sequence needs to be present in the C-FIND-RQ to be returned

Attribute Name	Tag	Matching Type	Comments
>Universal Entity ID	(0040,0032)	UNIVERSAL	
>Universal Entity ID Type	(0040,0033)	UNIVERSAL	
>Identifier Type Code	(0040,0035)	UNIVERSAL	
Other Patient IDs Sequence	(0010,1002)	SEQUENCE	If sequence is sent empty in the C-FIND-RQ, only Patient ID, issuer of Patient ID and Type of Patient ID tags will be returned. One item per existing PID/PID Issuer will be returned
> Patient ID	(0010,0020)	UNIVERSAL	
> Issuer of Patient ID	(0010,0021)	UNIVERSAL	
>Type of Patient ID	(0010,0022)	UNIVERSAL	
> Issuer of Patient ID Qualifiers Sequence	(0010,0024)	SEQUENCE	Tags in the sequence needs to be present in the C-FIND-RQ to be returned
>>Universal Entity ID	(0040,0032)	UNIVERSAL	Tag only returned if it is also requested in the root
>>Universal Entity ID Type	(0040,0033)	UNIVERSAL	Tag only returned if it is also requested in the root
>>Identifier Type Code	(0040,0035)	UNIVERSAL	Tag only returned if it is also requested in the root
Patient Demographic			
Patient Birth Date	(0010,0030)	UNIVERSAL	
Patient Sex	(0010,0040)	UNIVERSAL	
Patient's Weight	(0010,1030)	UNIVERSAL	
Patient's Size	(0010,1020)	UNIVERSAL	
Confidentiality Constraint	(0040,3001)	UNIVERSAL	Not supported. Tag Always returned with no value
Patient Medical			
Patient State	(0038,0500)	UNIVERSAL	Not supported. Tag Always returned with no value
Medical Alerts	(0010,2000)	UNIVERSAL	Not supported. Tag always returned with no value
Allergies	(0010,2110)	UNIVERSAL	Always returned empty, even if there is an allergy entered for the Patient
Special Needs	(0038,0050)	UNIVERSAL	Not supported. Tag Always returned with no value

If Scheduled Procedure Step status (0040,0020) is not specified in the C-FIND-RQ, by default, The Core Server AE only return Modality Worklist Items that have Scheduled Procedure Step Status SCHEDULED, ORDERED or STARTED.

If the received request specifies an unsupported Specific Character Set (0008,0005) element, Modality Worklist-SCP will try to find any matching records using the constraints specified in the request as is without any modification.

5.2.2 Modality Performed Procedure Step Service

5.2.2.1 SCU of the Modality Performed Procedure Step SOP Class - N/A

N/A

5.2.2.2 SCP of the Modality Performed Procedure Step SOP Class

As a Service Class Provider of the Modality Performed Procedure Step SOP Class, the product receives N-CREATE-RQ and N-SET-RQ messages from a remote SCU indicating the status of a procedure.

In the N-CREATE and N-SET Column, the following values can be used:

Y: Attribute must be present

N: Attribute Not allowed

Empty Cell: Attribute May or may not be present

Table 5-3 lists the message content that is required.

Table 5-3 Supported N-CREATE and N-SET Attributes for Modality Performed Procedure Step – SCP

Attribute Name	Tag	Required in N-CREATE	Required in N-SET	Comments
Specific Character Set	(0008,0005)			Use the default Character Set defined in Core Server is not present
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	(0040,0270)	Y	N	
>Study Instance UID	(0020,000D)	Y	N	
>Referenced Study Sequence	(0008,1110)		N	Sequence can be empty
>>Referenced SOP Class UID	(0008,1150)		N	
>>Referenced SOP Instance UID	(0008,1155)		N	
>Accession Number	(0008,0051)		N	
>Requested Procedure ID	(0040,1001)	Y	N	
>Requested Procedure Description	(0032,1060)		N	
>Scheduled Procedure Step ID	(0040,0009)		N	
>Scheduled Procedure Step Description	(0040,0007)		N	
>Scheduled Protocole Code Sequence	(0040,0008)		N	Sequence can be empty
>>Code Value	(0008,0100)		N	
>>Coding Scheme Designator	(0008,0102)		N	
>>Code Meaning	(0008,0104)		N	
Patient Name	(0010,0010)	Y	N	May be with no Value in N-CREATE
Patient ID	(0010,0020)	Y	N	May be with no Value in N-CREATE
Patient Birth Date	(0010,0030)	Y	N	May be with no Value in N-CREATE
Patient's Sex	(0010,0040)	Y	N	May be with no Value in N-CREATE
Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	Y	N	

Attribute Name	Tag	Required in N-CREATE	Required in N-SET	Comments
Performed Station AE Title	(0040,0241)		N	Type 1 attribute for N-CREATE however, by default, Core Server does not complain when attribute or value is missing (configurable)
Performed Station Name	(0040,0242)		N	Displayed in the UI
Performed Location	(0040,0243)		N	
Performed Procedure Step Start Date	(0040,0244)		N	Type 1 attribute for N-CREATE however, by default Core Server does not complain when attribute or value is missing. It sets today's date
Performed Procedure Step Start Time	(0040,0245)		N	Type 1 attribute for N-CREATE however, by default, Core Server does not complain when attribute or value is missing. It sets current time
Performed Procedure Step Status	(0040,0252)	Y	Y	IN PROGRESS value in N-CREATE COMPLETED or DICONTINUED value in N-SET
Performed Procedure Step Description	(0040,0254)			
Procedure Code Sequence	(0008,1032)			
>Code Value	(0008,0100)			
>Coding Scheme Designator	(0008,0102)			
>Code Meaning	(0008,0104)			
Performed Procedure Step End Date	(0040,0250)			If not present in N-SET, the End date will be missing in the UI
Performed Procedure Step End Time	(0040,0251)			If not present in N-SET, the End time will be missing in the UI
Comments on the Performed Procedure Step	(0040,0280)			The comments are improperly displayed as "Reason for Discontinuation" in the UI
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)			
>Code Value	(0008,0100)			Value must be 110504
>Coding Scheme Designator	(0008,0102)			
>Code Meaning	(0008,0104)			Not displayed in the UI in the current version. Will be in a future version
Image Acquisition Results				
Modality	(0008,0060)		N	Type 1 attribute for N-CREATE however, by default Core Server does not complain when attribute or value is missing (configurable)
Study ID	(0020,0010)		N	
Performed Protocol Code Sequence	(0040,0260)			
>Code Value	(0008,0100)			

Attribute Name	Tag	Required in N-CREATE	Required in N-SET	Comments
>Coding Scheme Designator	(0008,0102)			
>Code Meaning	(0008,0104)			
Performed Series Sequence	(0040,0340)			Type 1 attribute for N-SET COMPLETE, however Core server always accept the message if the sequence is missing
>Performing Physician's Name	(0008,1050)			
>Protocol Name	(0018,1030)			
>Operator's Name	(0008,1070)			
>Series Instance UID	(0020,000E)			
>Series Description	(0008,103E)			
>Retrieve AE Title	(0008,0054)			
>Referenced Image Sequence	(0008,1140)			
>>Referenced SOP Class UID	(0008,1150)			
>>Referenced SOP Instance UID	(0008,1155)			
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)			
>>Referenced SOP Class UID	(0008,1150)			
>>Referenced SOP Instance UID	(0008,1155)			

By default, Core Server accepts the MPPS N-CREATE and N-SET messages even when some type 1 attributes are missing as long as they are not mandatory for the internal business logic.
The MPPS status for a procedure is reflected in the text area of the Diagnostic or acquisition desktop.

5.2.3 Unified Worklist and Procedure Step Service – N/A

N/A

5.2.4 Instance Availability Notification Service

5.2.4.1 SCU of the Instance Availability Notification SOP Class – N/A

N/A

5.2.4.2 SCP of the Instance Availability Notification SOP Class – N/A

Even though, the SOP class is accepted, the notifications are not processed by Enterprise Imaging.

5.2.5 Storage Service

5.2.5.1 SCU on the Storage SOP Classes

As a Service Class User of the Storage Service Class, Enterprise Imaging uses the C-STORE-RQ message to request storage of DICOM objects by a remote SCP. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

For details regarding the content of SOP Instances that are created by the system, see Annex A, which describes the underlying IOD of the supported SOP Classes.

C-STORE is triggered in following circumstances:

- The user initiates a transmit request to a remote DICOM destination.
- The Core Server Storage-SCU will establish an association automatically
    - in response to a C-MOVE request
    - when archiving rule to one or more VNA is configured
    - when forwarding rules to one or more DICOM device is configured

5.2.5.1.1 Transcoding of Transfer Syntaxes

Enterprise Imaging Storage-SCU may request any of the Presentation Contexts listed in Table 1-2**Error! Reference source not found.** for Storage. As a general rule, Enterprise Imaging Storage SCU will propose the transfer syntax used in the version of the file stored in Enterprise Imaging as well as Explicit VR Little Endian and Implicit VR Little Endian. Enterprise Imaging Storage-SCU uses the first transfer syntax in accepted presentation contexts to transfer the object.

Table 5-4 describes supported transcoding between the locally stored encoding of SOP Instances and the negotiated Transfer Syntax. The following Values can be used:

- SUPPORTED: Transcoding is possible and same SOP Instance UID is re-used.
- NEW_UID: Transcoding is possible; however a new SOP Instance is created for transfer, e.g., due to lossy compression.
- NOT_SUPPORTED: Transcoding is not possible.

Table 5-4 Transcoding of Transfer Syntaxes

Stored Transfer Syntax	Sent Transfer Syntax				
	Implicit VR Little Endian	**Explicit VR Little Endian**	**JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)**	**JPEG Baseline (Process 1) (Lossy)**	**Stored Transfer Syntax**
Implicit VR Little Endian	SUPPORTED	SUPPORTED	SUPPORTED (See Note 1 and 2)	NOT_SUPPORTED	
Explicit VR Little Endian	SUPPORTED	SUPPORTED	SUPPORTED (See Note 1 and 2)	NOT_SUPPORTED	
JPEG Lossless, Non-Hierarchical, First-	SUPPORTED	SUPPORTED	SUPPORTED (See Note 1 and 2)	NOT_SUPPORTED	

Stored Transfer Syntax	Sent Transfer Syntax				
	Implicit VR Little Endian	Explicit VR Little Endian	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	JPEG Baseline (Process 1) (Lossy)	Stored Transfer Syntax
Order Prediction (Process 14)					
JPEG Baseline (Process 1)	SUPPORTED	SUPPORTED	NOT_SUPPORTED	SUPPORTED (See Note 2)	
Video Transfer Syntaxes	NOT_SUPPORTED	NOT_SUPPORTED	NOT_SUPPORTED	NOT_SUPPORTED	SUPPORTED
Any other Compressed Stored Transfer Syntax	SUPPORTED	SUPPORTED	NOT_SUPPORTED	NOT_SUPPORTED	SUPPORTED

Note

1. Image Objects only
2. Transfer syntax used in priority (negotiated in the first presentation context)

5.2.5.2 SCP of the Storage SOP Classes

As a Service Class Provider of the Storage Service Class, the Core Server receives the C-STORE-RQ message from remote SCUs. See Section 1.1 Content and Transfer in the Section 1 for the list of supported SOP Classes.

Table 5-5 defines the conformance levels of Enterprise Imaging.

Table 5-5 Levels of Conformance

Levels of Conformance	2
Level of Digital Signature Support	1

5.2.5.2.1 Coerced / Modified Attributes

As a general rule, attribute coercion is configurable for IOD's received by the Core Server. Attributes can either be mapped or may be filled with "fixed values" depending on the existence or the content(s) of one or more other Attributes.

Patient Information, Patient Demographics and Study Information will be updated automatically by information received from HIS/RIS based upon corresponding patient and order information.

The coerced/modified Attribute values are provided when a remote Query/Retrieve SCU queries information or when SOP Instances are sent to a remote Storage SCP.

More specifically, the Core Server coerces the Attributes listed in Table 5-6 upon receiving them from other systems.

The "SOP Class UID" column indicates whether the coercion is applicable to specific SOP Classes or to "ALL" SOP Classes.

The "Type of Change" column defines the coercion done to the Attributes, the following Values can be used:

- MODIFIED: The Value of the Attribute is changed; the new Value is described in the "New Value" column.
- ADDED: The Attribute or the Value **(if not presents**) is (are) added with the Value defined in the "New Value" column.
- REMOVED: That Attribute is completely removed from the instance.

The "Condition" column defines the condition under which coercion is performed. The following Values can be used:

- ALWAYS: Data coercion is performed on each instance of the specified SOP Class that is received by the system.
- EXTERNAL: Data coercion is performed on instances received from systems external to the institution.
- CONFIGURATION: Data coercion is performed based on system configuration.
- OTHER: Data coercion is performed for other conditions. Details are defined in the "Comments" column.

Table 5-6 Attribute Coercion by Storage SCP

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Patient Name	(0010,0010)	ALL	ADDED	Unknown^Unknown	ALWAYS	
Patient ID	(0010,0020)	ALL	ADDED	AG<xxxxxxxx>	ALWAYS	Prefix + 8 digit
Issuer of Patient ID	(0010,0021)	ALL	ADDED	CONFIGURATION	ALWAYS	**If Patient ID added, value is:** <System default>_DCM. **If no default issuer defined, value is:** AGEI_NOAA<x> (internal only. It is not transmitted to external systems) **If a default issuer defined, value is:** <Default issuer>
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	ALL	ADDED	SEQUENCE	ALWAYS	One item
>Universal Entity ID	(0040,0032)	ALL	ADDED		OTHER	Tag is only added if in the configuration the default issuer is set with a Universal Entity ID
>Universal Entity ID Type	(0040,0033)	ALL	ADDED	ISO	OTHER	Tag is only added if in the configuration the default issuer is set with a Universal Entity ID Type
>Identifier Type Code	(0040,0035)	ALL	ADDED	PAT_CODE	ALWAYS	
Patient Sex	(0010,0040)	ALL	ADDED	O	ALWAYS	
Other Patient IDs Sequence	(0010,1002)	ALL	ADDED	SEQUENCE	ALWAYS	As many items as Patient ID's including the one in the root

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
> Patient ID	(0010,0020)	ALL	ADDED		ALWAYS	
> Issuer of Patient ID	(0010,0021)	ALL	ADDED		ALWAYS	
>Type of Patient ID	(0010,0022)	ALL	ADDED	TEXT	ALWAYS	
> Issuer of Patient ID Qualifiers Sequence	(0010,0024)	ALL	ADDED	SEQUENCE	ALWAYS	
>>Universal Entity ID	(0040,0032)	ALL	ADDED		OTHER	Tag is only added if in the issuer contains a Universal Entity ID
>>Universal Entity ID Type	(0040,0033)	ALL	ADDED	ISO	OTHER	Tag is only added if the issuer contains Universal Entity ID Type
>>Identifier Type Code	(0040,0035)	ALL	ADDED	PAT_CODE	ALWAYS	ALL

5.2.5.2.1.1 Reassignment of Private Elements Reserved Blocks

As specified by DICOM, reassigning of private element reserved blocks within a private group number is permitted as long as the Private Creator data element value (which is the unique identifier) stay the same (is not modified).

When Enterprise Imaging receives DICOM IODs containing private data elements, it may reassign the private elements reserved blocks for a given Private creator. This reassignment of reserved blocks may occur in the DICOM root and in the DICOM sequence items if there is a conflicting situation where 2 different private creators share the same attribute group number and the same elements reserved blocks.

But it can also occur in the following circumstances:

If the elements Reserved block is not the lowest available for a given private Creator, EI will reassign the reserved block to the lowest available.

For example, if the first private creator element in the DICOM header is: (0031,0011) “HappyModality Private ID”, the reserved data elements for the private creator “HappyModality Private ID” are (0031, 1100-11FF). EI will reassign the reserved data elements to the lowest block available (1000-10FF). As a consequence the private creator data element will become: (0031,0010) “HappyModality Private ID”.

5.2.5.2.2 Limitations on Displaying / Processing Instances

Table 5-7 lists any limitations on displaying or processing instances, e.g., display or processing of the respective SOP Instances is prevented by an unsupported Value for an Attribute or the absence of that Attribute.

The "Effect" column describes what happens if the limitation is encountered. The following Values are used:

- ND: Display is not possible
- LD: Display is limited

- NP: Processing is not possible
- LP: Processing is limited
- OT: Other effects described in the "Comments" column

Table 5-7 Display and Processing Limitations for Storage SCP

Limitation Case			Effect	Comments
Attribute Name	**Tag**	**Value**		
Video Endoscopic Image Storage (1.2.840.10008.5.1.4.1.1.77.1.1.1)				
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2.4.50	LD	Diagnostic / Acquisition / Clinician desktops cannot display the video. XERO Viewer can display the video
		1.2.840.10008.1.2.4.101		
		1.2.840.10008.1.2.4.102		
		1.2.840.10008.1.2.4.103		
		1.2.840.10008.1.2.4.104	ND	None of the viewers can display the video
		1.2.840.10008.1.2.4.105		
Video Microscopic Image Storage (1.2.840.10008.5.1.4.1.1.77.1.2.1)				
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2.4.50	LD	Diagnostic / Acquisition / Clinician desktops cannot display the video. XERO Viewer can display the video
		1.2.840.10008.1.2.4.101		
		1.2.840.10008.1.2.4.102		
		1.2.840.10008.1.2.4.103		
		1.2.840.10008.1.2.4.104	ND	None of the viewers can display the video
		1.2.840.10008.1.2.4.105		
Video Photographic Image Storage (1.2.840.10008.5.1.4.1.1.77.1.4.1)				
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2.4.50	LD	Diagnostic / Acquisition / Clinician desktops cannot display the video. XERO Viewer can display the video
		1.2.840.10008.1.2.4.101		
		1.2.840.10008.1.2.4.102		
		1.2.840.10008.1.2.4.103		
		1.2.840.10008.1.2.4.104	ND	None of the viewers can display the video
		1.2.840.10008.1.2.4.105		

5.2.5.2.3 Actions Performed Upon Receiving Instances

Table 5-8 lists the actions performed upon receiving instances from a remote AE and the system behavior when certain conditions are encountered.

Table 5-8 Behavior when storing Instances

Action upon Receiving	Condition	System Behavior
Perform Attribute Validation	Duplicate Instance UID in the same study	Accept and ignore silently the instance (Keep the original instance)

Action upon Receiving	Condition	System Behavior
Evaluate **Key Object Selection** Code Value in the Concept name code sequence (0040,A043)	113039: Data Policy Retention expired (IOCM)	Delete instances referenced in the KOS. Once the instances are deleted the KOS is deleted as well. In case the same (deleted) instances are sent again, they will be accepted
	113037: Rejected for Patient Safety Reasons (IOCM)	Delete instances referenced in the KOS. The KOS is kept in the study. In case the same (deleted) instances are sent again, they will be rejected.
	113038: Incorrect Modality Workflist Entry (IOCM)	Delete instances referenced in the KOS. The KOS is kept in the study. In case the same (deleted) instances are sent again, they will be rejected.
	All other Codes	Mark key images in the UI with the code meaning.

5.2.5.2.4 Compression Handling

Table 5-9 describes how the SCP handles compression for stored instances.

The following Values are used in the "Behavior" column:

- AS_IS: Images are stored as received.
- CONFIGURATION: Images are compressed based on internal configuration settings.
- DEFAULT: Compression used by default
- OTHER: All other conditions, which are further described in the "Comments" column.

The Transfer Syntax is used to describe the compression mechanism applied.

Table 5-9 Image Compression by Storage SCP

SOP Class		Behavior	Transfer Syntax		Comments
MONOCHROME Images Received uncompressed (U)		DEFAULT	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	Valid for all listed IOD's
Computed Radiography Image IOD	1.2.840.10008.5.1.4.1.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Digital X-Ray Image IOD – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Digital X-Ray Image IOD – for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Digital Mammography X-Ray Image IOD – for Presentation	1.2.840.10008.5.1.4.1.1.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	

SOP Class		Behavior	Transfer Syntax		Comments
Digital Mammography X-Ray Image IOD – for Processing	1.2.840.10008.5.1.4.1.1.1.2.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Digital Intra-Oral X-Ray Image IOD – for Presentation	1.2.840.10008.5.1.4.1.1.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Digital Intra-Oral X-Ray Image IOD – for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Computed Tomography Image IOD	1.2.840.10008.5.1.4.1.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced CT Image IOD	1.2.840.10008.5.1.4.1.1.2.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Multi-frame Image IOD	1.2.840.10008.5.1.4.1.1.3.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Magnetic Resonance Image IOD	1.2.840.10008.5.1.4.1.1.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced MR Image IOD	1.2.840.10008.5.1.4.1.1.4.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced MR Color Image IOD	1.2.840.10008.5.1.4.1.1.4.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Image IOD	1.2.840.10008.5.1.4.1.1.6.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
SC Image Information Objection Definition	1.2.840.10008.5.1.4.1.1.7	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Multi-frame Single Bit Secondary Capture Image IOD	1.2.840.10008.5.1.4.1.1.7.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Multi-frame Grayscale Byte Secondary Capture Image IOD	1.2.840.10008.5.1.4.1.1.7.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Multi-frame Grayscale Word Secondary Capture Image IOD	1.2.840.10008.5.1.4.1.1.7.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Multi-frame True Color Secondary Capture Image IOD	1.2.840.10008.5.1.4.1.1.7.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
X-Ray Angiographic Image IOD	1.2.840.10008.5.1.4.1.1.12.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced X-Ray Angiographic Image IOD	1.2.840.10008.5.1.4.1.1.12.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
X-Ray RF Image IOD	1.2.840.10008.5.1.4.1.1.12.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced X-Ray RF Image IOD	1.2.840.10008.5.1.4.1.1.12.2.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	

SOP Class		Behavior	Transfer Syntax		Comments
X-Ray 3D Angiographic Image IOD	1.2.840.10008.5.1.4.1.1.13.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
X-Ray 3D Craniofacial Image IOD	1.2.840.10008.5.1.4.1.1.13.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Breast Tomosynthesis Image IOD	1.2.840.10008.5.1.4.1.1.13.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Nuclear Medicine Image IOD	1.2.840.10008.5.1.4.1.1.20	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Endoscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Microscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Slide-Coordinates Microscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Photographic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ophthalmic Photography 8 Bit Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ophthalmic Photography 16 Bit Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ophthalmic Tomography Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Wide Field Ophthalmic Photography Stereographic Projection Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.5	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Whole Slide Microscopy Image IOD	1.2.840.10008.5.1.4.1.1.77.1.6	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Positron Emission Tomography Image IOD	1.2.840.10008.5.1.4.1.1.128	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced PET Image IOD	1.2.840.10008.5.1.4.1.1.130	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Legacy Converted Enhanced PET Image IOD	1.2.840.10008.5.1.4.1.1.128.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
RT Image IOD	1.2.840.10008.5.1.4.1.1.481.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	

SOP Class		Behavior	Transfer Syntax		Comments
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
RGB Images Received uncompressed (U)		DEFAULT	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	Valid for all listed IOD's
Digital Mammography X-Ray Image IOD – for Presentation	1.2.840.10008.5.1.4.1.1.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Computed Tomography Image IOD	1.2.840.10008.5.1.4.1.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Magnetic Resonance Image IOD	1.2.840.10008.5.1.4.1.1.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced MR Image IOD	1.2.840.10008.5.1.4.1.1.4.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Enhanced MR Color Image IOD	1.2.840.10008.5.1.4.1.1.4.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Image IOD	1.2.840.10008.5.1.4.1.1.6.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
SC Image Information Objection Definition	1.2.840.10008.5.1.4.1.1.7	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Multi-frame True Color Secondary Capture Image IOD	1.2.840.10008.5.1.4.1.1.7.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Nuclear Medicine Image IOD	1.2.840.10008.5.1.4.1.1.20	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Endoscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Microscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.2	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Slide-Coordinates Microscopic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
VL Photographic Image IOD	1.2.840.10008.5.1.4.1.1.77.1.4	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ophthalmic Photography 8 Bit Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Wide Field Ophthalmic Photography Stereographic Projection Image IOD	1.2.840.10008.5.1.4.1.1.77.1.5.5	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	

SOP Class		Behavior	Transfer Syntax		Comments
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	DEFAULT	JPEG Lossless	1.2.840.10008.1.2.4.70	
Non-Image SOP classes					
All Non-Image IODs		AS_IS	Non-Image documents (SR etc.) will by default be retained in the original format and are not compressed		
Image / Video SOP classes received Compressed (L; LL; V)					
All Image / Video SOP classes		AS_IS	Images ingested with a negotiated transfer syntax which includes compression are stored using the same compression encoding.		

5.2.6 Storage Commitment Service

5.2.6.1 SCU of the Storage Commitment SOP Class

As a Service Class User of the Storage Commitment SOP Class, the Core Server uses the N-ACTION-RQ message to request storage commitment from a remote SCP when the remote SCP is configured as a DICOM Archive. In turn, it receives N-EVENT-REPORT-RQ messages from the SCP indicating success or failure of the request.

As a Service Class User of the Storage Commitment Push Model SOP Classes the product supports committing all Storage SOP Classes listed in Section 1.1 Content and Transfer.

The Core Server Storage Commitment Request-SCU will keep the Transaction ID applicable indefinitely.

The Core Server does not supports receiving the N-EVENT-REPORT request on the same Association as the N-ACTION. It closes the N-ACTION association immediately after receiving the N-ACTION-RSP.

Table 5-10 lists the behavior of the Core Server for each possible Failure Reason (0008,1197) in the Failed SOP Sequence (0008,1198) upon receiving an N-EVENT-REPORT request from the SCP with an Event Type ID of 2 (Storage Commitment Request Complete - Failures Exist).

Table 5-10 Failure Behavior for Storage Commitment SCU

Status Code	Description	Behavior
0110	Processing failure: A general failure in processing the operation was encountered.	The study or series containing the failed instances are re-sent and the N-ACTION request is repeated 4 times.
0112	No such object instance: One or more of the elements in the Referenced SOP Instance Sequence was not available.	Same as 0110
0119	Class / Instance conflict: The SOP Class of an element in the Referenced SOP Instance Sequence did not correspond to the SOP Class registered for this SOP Instance at the SCP.	Same as 0110

Status Code	Description	Behavior
0122	Referenced SOP Class not supported: Storage Commitment has been requested for a SOP Instance with a SOP Class that is not supported by the SCP.	Same as 0110
0131	Duplicate Transaction UID: The Transaction UID of the Storage Commitment Request is already in use.	Same as 0110
0213	Resource limitation: The SCP does not currently have enough resources to store the requested SOP Instance(s).	Same as 0110

5.2.6.2 SCP of the Storage Commitment SOP Class

As a Service Class Provider of the Storage Commitment SOP Class, the Core Server receives the N-ACTION-RQ message to request storage commitment from a remote SCU. In turn it initiates the N-EVENT_REPORT-RQ messages to the SCU indicating success (Event Type ID=1 or failure (Event Type ID=2) of the request.

The Core Server attempt to send the N-EVENT-REPORT in the same association as the N-ACTION. If the N-ACTION association closes during the transaction, the core server will initiate a new association to send the N-EVENT-REPORT.

In the event that the Core Server Storage Commitment-SCP cannot commit to storing SOP Instances, the Core Server Storage Commitment-SCP issues an N-EVENT-REPORT to the SCU including references to the failed SOP Instances contained in the N-ACTION.

Table 5-11 lists conditions upon which an error code is sent in the Failure Reason (0008,1197) Attribute in the Failed SOP Sequence (0008,1198) of the N-EVEN-REPORT request. Event Type ID=2 (Storage Commitment Request Complete - Failures Exist)

Table 5-11 Failure Conditions on Storage Commitment SCP

Status Code	Description	Conditions
0110	Processing Failure.	A general failure in processing the operation was encountered.
0112	No Such Object Instance.	One or more of the elements in the Referenced SOP Instance Sequence was not available.
0113	No Such Event Type	The event type specified was not recognized
0114	No Such Argument	The event/action information specified was not recognized/supported
0115	Invalid Argument Value	The event/action information value specified was out of range or otherwise inappropriate
0117	Invalid Object Instance	The SOP Instance UID specified implied a violation of the UID construction rules
0118	No Such SOP Class	the SOP Class was not recognized
0119	Class / Instance Conflict.	The SOP Class of an element in the Referenced SOP Instance Sequence did not correspond to the SOP Class registered for this SOP Instance at the SCP.
0210	Duplicate Invocation	the Message ID (0000,0110) specified is allocated to another notification or operation
0211	Unrecognized Operation	the operation is not one of those agreed between the DIMSE-service-users

Status Code	Description	Conditions
0212	Mistyped Argument	one of the parameters supplied has not been agreed for use on the Association between the DIMSE-service-users

The N-EVENT-REPORT contains the Transaction UID value contained in the initiating N-ACTION. Core Server supports the optional Retrieve AE Title (0008,0054) Attributes in the N-EVENT-REPORT

Enterprise Imaging Storage Commitment-SCP will store SOP Instances indefinitely unless the instances are manually deleted by a user with appropriate system permissions. The capacity is limited only by the availability of archive storage and volatility is dependent on the archive medium used. Enterprise Imaging Storage Commitment-SCP will stop accepting new objects for storage to ensure the availability of objects for which a successful storage commitment response has been sent.

5.2.7 QUERY/RETRIEVE Service Class

5.2.7.1 SCU of the Study Root Q/R Information Model - FIND SOP Class

As a Service Class User of the Study Root Q/R - Information Model - FIND SOP Class, the Core Server or the Web Server uses the C-FIND-RQ message and supports the Query Keys listed in Table 5-12 for hierarchical queries.

In the "Matching Type" column the following Values can be used:

- SINGLE_VALUE: SCU can request Single Value matching on this Attribute.
- UID: SCU can request List of UID matching on this Attribute.
- WILDCARD: SCU can request Wildcard matching on this Attribute.
- RANGE: SCU can request Range matching on this Attribute.
- SEQUENCE: SCU can request Sequence matching on this Attribute.
- UNIVERSAL: SCU can request that the Attribute be a return Value (universal matching).

In the "Query Value Source" column the following Values can be used:

- FIXED: The query Value cannot be modified by the user or by configuration.
- GENERATED: The query Value is generated by the system (e.g., current date as the study date).
- CONFIGURATION: The query Value is dependent on system configuration.
- USER: The query Value is entered by the user.
- SCANNED: The query Value is read from a barcode scanner or similar device.
- EMPTY: The query Value is sent with a zero-length value to indicate it is a return key only.

In the "Display on UI" column the following Values can be used:

- D: the return Value is displayed on the main UI by default.

- C: the return Value is displayed on the main UI if configured.
- N: the return Value is never displayed.

Table 5-12 Supported C-FIND Attribute Matching for Study Root Q/R Model -SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Study Level						
Study Date	(0008,0020)	SINGLE_VALUE; RANGE; UNIVERSAL	USER; USER; EMPTY		D	
Study Time	(0008,0030)	UNIVERSAL	EMPTY		C	
Accession Number	(0008,0050)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		D	Wild card '*' automatically added to matching key
Patient's Name	(0010,0010)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		D	Wild card '*' automatically added to matching key
Patient ID	(0010,0020)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		D	Wild card '*' automatically added to matching key
Study ID	(0020,0010)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		C	Wild card '*' automatically added to matching key
Study Instance UID	(0020,000D)	SINGLE_VALUE; UNIVERSAL	USER EMPTY		C	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	FIXED	STUDY	N	
Modalities in Study	(0008,0061)	SINGLE_VALUE UNIVERSAL	USER EMPTY		D	
Referring Physician's Name	(0008,0090)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		C	Wild card '*' automatically added to matching key
Timezone offset from UTC	(0008,0201)	UNIVERSAL	EMPTY		C	
Study Description	(0008,1030)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER GENERATED EMPTY		C	Wild card '*' automatically added to matching key
Procedure Code Sequence	(0008,1032)	UNIVERSAL	EMPTY		C	
Institution Name	(0008,0080)	UNIVERSAL	EMPTY		N	
Institutional Department Name	(0008,1040)	UNIVERSAL	EMPTY		N	
Name of Physician(s) Reading Study	(0008,1060)	UNIVERSAL	EMPTY		N	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Admitting Diagnoses Description	(0008,1080)	UNIVERSAL	EMPTY		N	
Issuer of Patient ID	(0010,0021)	UNIVERSAL	EMPTY		C	
Patient's Birth Date	(0010,0030)	SINGLE_VALUE; UNIVERSAL	USER EMPTY		D	
Patient's Sex	(0010,0040)	SINGLE_VALUE; UNIVERSAL	USER EMPTY	M; F; O	D	
Other Patient IDs	(0010,1000)	UNIVERSAL	EMPTY		N	Retired
Other Patient IDs Sequence	(0010,1002)	UNIVERSAL	EMPTY		C	
Patient's Age	(0010,1010)	UNIVERSAL	EMPTY		C	
Additional Patient History	(0010,21B0)	UNIVERSAL	EMPTY		N	
Number of Patient Related Studies	(0020,1200)	UNIVERSAL	EMPTY		N	
Number of Study Related Series	(0020,1206)	UNIVERSAL	EMPTY		C	
Number of Study Related Instances	(0020,1208)	UNIVERSAL	EMPTY		C	
Study Status ID	(0032,000A)	UNIVERSAL	EMPTY		N	
Requesting Physician	(0032,1032)	UNIVERSAL	EMPTY		N	
Study Comments	(0032,4000)	UNIVERSAL	EMPTY		D	
Current Patient Location	(0038,0300)	UNIVERSAL	EMPTY		D	
Confidentiality Code	(0040,1008)	UNIVERSAL	EMPTY		N	
Series Level (Web server always Queries at SERIES level – Core Server, only when SERIES level attributes are requested)						
Modality	(0008,0060)	SINGLE_VALUE; UNIVERSAL	USER; EMPTY		D	
Series Number	(0020,0011)	UNIVERSAL	EMPTY		N	
Series Instance UID	(0020,000E)	UNIVERSAL	EMPTY		N	XERO
					C	Diagnostic/ Acquisition / Clinician Desktop
Number of Series Related Instances	(0020,1209)	UNIVERSAL	EMPTY		N	
Series Date	(0008,0021)	UNIVERSAL	EMPTY		C	
Series Time	(0008,0031)	UNIVERSAL	EMPTY		C	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	FIXED	SERIES	N	
Manufacturer	(0008,0070)	UNIVERSAL	EMPTY		N	
Station Name	(0008,1010)	UNIVERSAL	EMPTY		N	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Series Description	(0008,103E)	UNIVERSAL	EMPTY		N	
Performing Physicians Name	(0008,1050)	UNIVERSAL	EMPTY		N	
Operators Name	(0008,1070)	UNIVERSAL	EMPTY		N	
Manufacturer Model Name	(0008,1090)	UNIVERSAL	EMPTY		N	
Study Instance UID	(0020,000D)	UID	GENERATED		N	From Study level
Scheduled Procedure Step ID	(0040,0009)	UNIVERSAL	EMPTY		N	
Performed Procedure Step Start Date	(0040,0244)	UNIVERSAL	EMPTY		N	
Performed Procedure Step End Date	(0040,0250)	UNIVERSAL	EMPTY		N	
Performed Procedure Step ID	(0040,0253)	UNIVERSAL	EMPTY		N	
Requested Procedure ID	0040,1001	UNIVERSAL	EMPTY		N	
(All Patient / Study Level Attributes from above)						
Instance Level (Only Web server Queries at IMAGE level)						
Image Type	(0008,0008)	UNIVERSAL	EMPTY		N	
SOP Class UID	(0008,0016)	UID	EMPTY		N	
SOP Instance UID	(0008,0018)	UID	EMPTY		N	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	FIXED	IMAGE	N	
Slice Thickness	(0018,0050)	UNIVERSAL	EMPTY		N	
Study Instance UID	(0020,000D)	UID	GENERATED		N	From Study level
Series Instance UID	(0020,000E)	UID	GENERATED		N	From Series level
Instance Number	(0020,0013)	UNIVERSAL	EMPTY		N	
Image Orientation Patient	(0020,0037)	UNIVERSAL	EMPTY		N	
Number of Patient Related Series	(0020,1202)	UNIVERSAL	EMPTY		N	
Number of Patient Related Images	(0020,1204)	UNIVERSAL	EMPTY		N	
Number of Frames	(0028,0008)	UNIVERSAL	EMPTY		N	
Rows	(0028,0010)	UNIVERSAL	EMPTY		N	
Columns	(0028,0011)	UNIVERSAL	EMPTY		N	
Window-Center	(0028,1050)	UNIVERSAL	EMPTY		N	
Window-Width	(0028,1051)	UNIVERSAL	EMPTY		N	
(All Patient / Series / Study Level Attributes from above)						

- **Core Server**:

Core Server provides standard conformance to the DICOM Query/Retrieve Service Class as an SCU. The Query/Retrieve Information Model used depends on the attributes used to constrain the query.

Core Server supports the Relational-queries extended SCU behavior for the Patient Root Query, Study Root Query, and Patient/Study Only Query/Retrieve.

Core Server may request any mandatory search keys during a relational query. Other search keys can be configured in the GUI.

- **Web Server**:

  Web Server will use Relational-queries extended SCP behavior if available, but can be configured to use non-Relational queries as required. For displaying a study, Web Server requires Object level required return keys Rows, Columns in addition to SOP class, SOP instance UID and Instance Number. It will use other keys as available. For this purpose, it will not use the Patient Root abstract syntax

5.2.7.2 SCU of the Patient Root Q/R Information Model - FIND SOP Class

The **Core Server** uses STUDY Level Query for Patient Root Q/R Information Model. See the supported Query keys Table 5-12 in the previous section.

The **Web server** supports the PATIENT level Query Keys listed in **Table 5-13** for Patient Root Q/R Information Model.

Table 5-13 Supported C-FIND Attribute Matching for Patient Root Q/R Model -SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Patient Level (only Web Server Queries at Patient level)						
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	FIXED	PATIENT	N	
Patient Name	(0010,0010)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER USER EMPTY		D	
Patient ID	(0010,0020)	SINGLE_VALUE; WILDCARD; UNIVERSAL	USER USER EMPTY		D	
Issuer of Patient ID	0010,0021	SINGLE_VALUE; UNIVERSAL	USER EMPTY		C	
Patient Birth Date	(0010,0030)	SINGLE_VALUE; UNIVERSAL	USER EMPTY		D	
Patient Sex	(0010,0040)	SINGLE_VALUE; UNIVERSAL	USER EMPTY	[M; F; O]	D	
Other Patient IDs	(0010,1000)	UNIVERSAL	EMPTY		N	Retired attribute
Other Patient IDs Sequence	(0010,1002)	UNIVERSAL	EMPTY		C	
Patient Age	(0010,1010)	UNIVERSAL	EMPTY		N	
Additional Patient History	(0010,21B0)	UNIVERSAL	EMPTY		N	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Number of Patient Related Studies	(0020,1200)	UNIVERSAL	EMPTY		N	
Current Patient Location	(0038,0300)	UNIVERSAL	EMPTY		N	
Study Level						
See Table 5-12 in the previous section						
Series Level						
See Table 5-12 in the previous section						
Image Level						
See Table 5-12 in the previous section						

5.2.7.3 SCU of the Study Root Q/R Information Model - MOVE SOP Class

The **Core Server** Move-SCU can retrieve composite objects from a remote AE. An association is established:

- When the user initiates a Retrieve from the Diagnostic / Acquisition / Clinician desktop's graphical user interface a C-MOVE-RQ at STUDY level is sent.
- Automatically to retrieve objects that were archived to the remote AE or to pre-fetch relevant objects from the remote AE based on configured prefetching rules. In this case C-MOVE-RQ at SERIES level is (are) sent

The **Web Server** Move-SCU can retrieve composite objects from a remote AE. An association is established when the user initiates a retrieve from XERO Viewer. C-MOVE-RQ at SERIES level is (are) sent.

5.2.7.4 SCU of the Patient Root Q/R Information Model - MOVE SOP Class

Only the Web Server supports the Patient Root Q/R Model – MOVE as SCU.

The **Web Server** Move-SCU can retrieve composite objects from a remote AE. An association is established when the user initiates a retrieve from the graphical user interface C-MOVE-RQ at SERIES level is (are) sent

5.2.7.5 SCP of the Study Root Q/R Information Model - FIND SOP Class

As a Service Class Provider of the Study Root Q/R - Information Model - FIND SOP Class, the **Core Server** uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Matching Keys listed in Table 5-14 for hierarchical queries.

In the "Matching Type" column, the following Values can be used:

- SINGLE_VALUE: SCP can perform single Value matching on this Attribute.
- UID: SCP can perform List of UID matching on this Attribute.

- WILDCARD: SCP can perform Wildcard matching on this Attribute.
- RANGE: SCP can perform Range matching on this Attribute.
- SEQUENCE: SCP can perform sequence matching on this Attribute.
- UNIVERSAL: SCP can provide the Attribute in the C-FIND response (universal matching).

Table 5-14 Supported C-FIND Attribute Matching for Study Root Q/R Model - SCP

Attribute Name	Tag	MatchingType	Comments
Study Level			
Study Date	(0008,0020)	SINGLE_VALUE; RANGE; UNIVERSAL	Matching keys for Date and Time are combined. For example, a Study Date of “20060705-20060707” and a Study Time of “1000-1800” will match the time period of July 5, 10am until July 7, 6pm, rather than the three time periods of 10am until 6pm on each of July 5, July 6 and July 7
Study Time	(0008,0030)	SINGLE_VALUE; RANGE; UNIVERSAL	
Accession Number	(0008,0050)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Patient's Name	(0010,0010)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Patient ID	(0010,0020)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Study ID	(0020,0010)	SINGLE_VALUE; UNIVERSAL	
Study Instance UID	(0020,000D)	UID; UNIVERSAL	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	STUDY
Retrieve AE Title	(0008,0054)	UNIVERSAL	Always returned
Modalities in Study	(0008,0061)	SINGLE_VALUE; UNIVERSAL	
Referring Physician’s Name	(0008,0090)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Study Description	(0008,1030)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Procedure Code Sequence	(0008,1032)	SEQUENCE	
Issuer of Patient ID	(0010,0021)	SINGLE_VALUE; UNIVERSAL	
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	SEQUENCE	
>Universal Entity ID	(0040,0032)	UNIVERSAL	
>Universal Entity ID Type	(0040,0033)	UNIVERSAL	
>Identifier Type Code	(0040,0035)	UNIVERSAL	
Patient’s Birth Date	(0010,0030)	SINGLE_VALUE; RANGE; UNIVERSAL	
Patient’s Sex	(0010,0040)	SINGLE_VALUE; UNIVERSAL	
Other Patient ID Sequence	(0010,1002)	SEQUENCE	If sequence is sent empty in the C-FIND-RQ, only Patient ID, issuer of Patient ID and Type of Patient ID tags will be returned. One item per existing PID/PID Issuer will be returned

Attribute Name	Tag	MatchingType	Comments
>Patient ID	(0010,0020)	UNIVERSAL	
>Issuer of Patient ID	(0010,0021)	UNIVERSAL	
>Issuer of Patient ID Qualifiers Sequence	(0010,0024)	UNIVERSAL	
>>Universal Entity ID	(0040,0032)	SEQUENCE	Tags in the sequence needs to be present in the C-FIND-RQ to be returned
>>Universal Entity ID Type	(0040,0033)	UNIVERSAL	Tag only returned if it is also requested in the root
>>Identifier Type Code	(0040,0035)	UNIVERSAL	Tag only returned if it is also requested in the root
Patient's Age	(0010,1010)	UNIVERSAL	
Number of Study Related Series	(0020,1206)	UNIVERSAL	
Number of Study Related Instances	(0020,1208)	UNIVERSAL	
Study Status ID	(0032,000A)	UNIVERSAL	Retired
Series Level			
Modality	(0008,0060)	SINGLE_VALUE; UNIVERSAL	
Series Number	(0020,0011)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Series Instance UID	(0020,000E)	UID; UNIVERSAL	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	SERIES
Retrieve AE Title	(0008,0054)	UNIVERSAL	Always returned
Institution Name	(0008,0080)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Institutional Department Name	(0008,1040)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Body Part Examined	(0018,0015)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Laterality	(0020,0060)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Request Attribute Sequence	(0040,0275)	SEQUENCE	
>Requested Procedure ID	(0040,1001)	UNIVERSAL	
>Requested Procedure Description	(0032,1060)	UNIVERSAL	
>Requested Procedure Code Sequence	(0032,1064)	SEQUENCE	
>>Code Value	(0008,0100)	UNIVERSAL	
>>Coding Scheme Designator	(0008,0102)	UNIVERSAL	
>>Coding Scheme Version	(0008,0103)	UNIVERSAL	

Attribute Name	Tag	MatchingType	Comments
>Reason for the Requested Procedure	(0040,1002)	UNIVERSAL	
>Scheduled Procedure Step ID	(0040,0009)	UNIVERSAL	
>Scheduled Procedure Step Description	(0040,0007)	UNIVERSAL	
>Scheduled Protocol Code Sequence	(0040,0008)	SEQUENCE	
>>Code Value	(0008,0100)	UNIVERSAL	
>>Coding Scheme Designator	(0008,0102)	UNIVERSAL	
>>Code Meaning	(0008,0104)	UNIVERSAL	
Performed Procedure Step Start Date	(0040,0244)	SINGLE_VALUE; RANGE; UNIVERSAL	
Performed Procedure Step Start Time	(0040,0245)	SINGLE_VALUE; RANGE; UNIVERSAL	
Number of Series Related Instances	(0020,1209)	UNIVERSAL	
Instance Level			
Instance Number	(0020,0013)	UNIVERSAL	
SOP Instance UID	(0008,0018)	UNIVERSAL	
SOP Class UID	(0008,0016)	UID; UNIVERSAL	
Content Date	(0008,0023)	SINGLE_VALUE; RANGE; UNIVERSAL	Matching keys for Date and Time are combined. For example, a Content Date of “20060705-20060707” and a Content Time of “1000-1800” will match the time period of July 5, 10am until July 7, 6pm, rather than the three time periods of 10am until 6pm on each of July 5, July 6 and July 7
Content Time	(0008,0033)	SINGLE_VALUE; RANGE; UNIVERSAL	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	SERIES
Retrieve AE Title	(0008,0054)	UNIVERSAL	Always returned
Concept Name Code Sequence	(0040,A043)	SEQUENCE	
>Code Value	(0008,0100)	SINGLE_VALUE; UNIVERSAL	
>Coding Scheme Designator	(0008,0102)	SINGLE_VALUE; UNIVERSAL	
>Coding Scheme Version	(0008,0103)	UNIVERSAL	
>Code Meaning	(0008,0104)	UNIVERSAL	
Completion Flag	(0040,A491)	SINGLE_VALUE; UNIVERSAL	
Verification Flag	(0040,A493)	SINGLE_VALUE; UNIVERSAL	

Enterprise Imaging Query/Retrieve-SCP provides standard conformance to the DICOM Query/Retrieve Service Class as an SCP.

Enterprise Imaging Query/Retrieve-SCP supports the Relational-queries extended SCP behavior. Matching for all PN VR attributes, but also for Study Description (0008,1030), Institution Name (0008,0080) and Institutional Department Name (0008,1040) is case-insensitive.

Enterprise Imaging Query/Retrieve-SCP provides support for the Instance Availability (0008,0056) Data Element on Study, Series and Instance Level, but not on Patient Level.

Instance availability is always returned with a value. See Table 5-15

Table 5-15 Supported value for Instance Availability

Value	Description
ONLINE	The image is immediately available.
NEARLINE	The image is automatically available. However, there may be a small delay in retrieval time.
OFFLINE	The image requires manual assistance to become online. The retrieval request will return a failure code.

5.2.7.6 SCP of the Patient Root Q/R Information Model - FIND SOP Class

As a Service Class Provider of the Patient Root Q/R - Information Model - FIND SOP Class, the **Core Server** uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Matching Keys listed in Table 5-16 for hierarchical queries.

Table 5-16 Supported C-FIND Attribute Matching for Patient Root Q/R Model - SCP

Attribute Name	Tag	Matching Type	Comments
Patient Level			
Patient's Name	(0010,0010)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Patient ID	(0010,0020)	SINGLE_VALUE; WILDCARD; UNIVERSAL	
Query/ Retrieve Level	(0008,0052)	SINGLE_VALUE	PATIENT
Issuer of Patient ID	(0010,0021)	SINGLE_VALUE; UNIVERSAL	
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	SEQUENCE	
>Universal Entity ID	(0040,0032)	UNIVERSAL	
>Universal Entity ID Type	(0040,0033)	UNIVERSAL	
>Identifier Type Code	(0040,0035)	UNIVERSAL	
Patient's Birth Date	(0010,0030)	SINGLE_VALUE; RANGE; UNIVERSAL	
Patient's Sex	(0010,0040)	SINGLE_VALUE; UNIVERSAL	
Other Patient ID Sequence	(0010,1002)	SEQUENCE	If sequence is sent empty in the C-FIND-RQ, only Patient ID, issuer of Patient ID and Type of Patient ID tags will be returned. One item per existing PID/PID Issuer will be returned
>Patient ID	(0010,0020)	UNIVERSAL	

Attribute Name	Tag	Matching Type	Comments
>Issuer of Patient ID	(0010,0021)	UNIVERSAL	
>Issuer of Patient ID Qualifiers Sequence	(0010,0024)	UNIVERSAL	
>>Universal Entity ID	(0040,0032)	SEQUENCE	Tags in the sequence needs to be present in the C-FIND-RQ to be returned
>>Universal Entity ID Type	(0040,0033)	UNIVERSAL	Tag only returned if it is also requested in the root
>>Identifier Type Code	(0040,0035)	UNIVERSAL	Tag only returned if it is also requested in the root
Study Level			
See **Table 5-14** in the previous section			
Series Level			
See **Table 5-14** in the previous section			
Instance Level			
See **Table 5-14** in the previous section			

5.2.7.7 SCP of the Study Root Q/R Information Model - MOVE SOP Class

As the SCP of the Study Root Q/R - Information Model - MOVE, the Core Server receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

As the SCU of the Storage Service Class, all Storage SOP Classes listed in Table 1-1 are supported.

The Core Server supports C-MOVE at STUDY, SERIES and IMAGE level. All instances of the requested level are sent in the same association. For example, all instances of a SERIES will be stored in a single association when the Core Server receives a C-MOVE-RQ at SERIES level

5.2.7.8 SCP of the Patient Root Q/R - Information Model - MOVE SOP Class

As the SCP of the Patient Root Q/R - Information Model - MOVE, the Core Server receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

As the SCU of the Storage Service Class, all Storage SOP Classes listed in Table 1-1 are supported.

The Core Server supports C-MOVE at STUDY, SERIES and IMAGE level. All instances of the requested level are sent in the same association. For example, all instances of a study will be stored in a single association when the Core Server receives a C-MOVE-RQ at STUDY level

5.2.8 Print Management Service

5.2.8.1 SCU of the Basic Grayscale Print Management Meta SOP Class

The Basic Grayscale Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in

Table **5-17**.

Table 5-17 Basic Grayscale Print Management Meta SOP Classes - SCU

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

5.2.8.1.1 Basic Film Session SOP Class

:

Table **5-18** lists the supported DIMSE Services for the Basic Film Session SOP Class:

Table 5-18 Services for the Basic Film Session SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the Film Session
N-ACTION	Print all Film Boxes in the Film Session

N-CREATE is used to create a Basic Film Session SOP Instance, when an association has been established. The N-CREATE causes the Basic Film Session (root element) to be created and its attributes initialized. The values are available in an xml-file that describes the technical capabilities of the printer and configured in a Print Preset. Furthermore, the user can make some final choices in an Export Dialog Box.

Table **5-19** lists the supported N-CREATE Attributes for Basic Film Session:

Table 5-19 Supported N-CREATE Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Values	Default
Number of Copies	(2000,0010)	[1…9]	1
Print Priority	(2000,0020)	LOW	LOW
Medium Type	(2000,0030)	PAPER; BLUE FILM; CLEAR FILM; MAMMO BLUE FILM; MAMMO CLEAR FILM	Depends on the selected Printer
Film Destination	(2000,0040)	MAGAZINE; PROCESSOR; BIN_i	PROCESSOR

N-ACTION will result in submitting a print job to print all the films of the film session in the order that they were received. This means that all subordinate Basic Film Boxes will be assembled into a print job for printing. Therefore, the job can contain more than one film.

5.2.8.1.2 Basic Film Box SOP Class

Table 5-20 lists the supported DIMSE Services for the Basic Film Box SOP Class:

Table 5-20 Supported Services for the Basic Film Box SOP Classes

DIMSE Service Element	Purpose
N-CREATE	Create the Film Box in a previously created Film Session
N-ACTION	Print the Film Box
N-DELETE	Delete the Film Box

N-CREATE is used to create a Basic Film Box SOP Instance under the created Film Session and initialize its attributes. The values are available in an xml-file that describes the technical capabilities of the printer and configured in a Print Preset. Furthermore, the user can make some final choices in an Export Dialog Box.

The creation of a Basic Film Box also causes the subordinate Image Boxes to be created for each location in the Image Display Format.

Table 5-21 lists the supported N-CREATE Attributes for Basic Film Box:

Table 5-21 Supported N-CREATE Attributes for the Basic Film Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Display Format	(2010,0010)	STANDARD\C,R ; ROW\R1,R2,R3, …; COL\C1,C2,C3, …; SLIDE; SUPERSLIDE	STANDARD\1,1
Film Orientation	(2010,0040)	PORTRAIT; LANDSCAPE	PORTRAIT
Film Size ID	(2010,0050)	8INX10IN; 8_5INX11IN; 10INX12IN; 11INX14IN; 11INX17IN; 14INX14IN; 14INX17IN; 24CMX24CM 24CMX30CM; A4; A3	Depends on the selected Printer
Magnification Type	(2010,0060)	REPLICATE; BILINEAR; CUBIC; NONE	CUBIC
Smoothing Type	(2010,0080)	Further specifies the type of the interpolation function. Only valid for Magnification Type (2010,0060) = CUBIC. Values supported by Agfa DICOM printers: **0** (= cubicB) **100 … 199** (cubicHighRes) **200…299** (cubicBell)	Depends on the selected Printer
Border Density	(2010,0100)	BLACK; WHITE; i, where i represents the desired density in hundredths of OD. (e.g. 150 corresponds with 1.5 OD)	BLACK
Empty Image Density	(2010,0110)	BLACK; WHITE; i, where i represents the desired density in hundredths of OD. (e.g. 150 corresponds with 1.5 OD)	BLACK

Attribute Name	Tag	Values	Default
Minimum Density	(2010,0120)	[10…150]	Depends on the selected Printer
Maximum Density	(2010,0130)	[150…400]	Depends on the selected Printer
Trim	(2010,0140)	YES; NO	NO
Configuration Information	(2010,0150)	Not sent if P-Value is configured Character string that contains either the ID of the printer configuration table that contains a set of values for implementation specific print parameters (e.g. perception LUT related parameters) or one or more configuration data values, encoded as characters. If there are multiple configuration data values encoded in the string, they shall be separated by backslashes. **Defined Terms**: **[CS000…CS999]**: Implementation specific curve type. Note: It is recommended that for SCPs, CS000 represent the lowest contrast and CS999 the highest contrast levels available. **For Agfa Printers**: **Perception LUT** : PERCEPTION_LUT= [LINEAR ; KANAMORI ; n ; OEMxxx] Where n = [75…220] **Color Separation table**: CS_TABLE = n where n = [0…18]	Depends on the selected Printer
Illumination	(2010,015E)	[1000…5000] Required when presentation LUT is enabled	2000
Reflective Ambient Light	(2010,0160)	[0…100] Required when presentation LUT is enabled	10
Referenced Film Session Sequence	(2010,0500)	sequence which provides references to the related Basic Film Session SOP Class/Instance pair. A single Item is present in this Sequence.	
>Referenced SOP Class UID	(0008,1150)	1.2.840.10008.5.1.1.1	
>Referenced SOP Instance UID	(0008,1155)	SOP Instance UID of the Film Session provided by the printer in the N-CREATE-RSP of the Basic Film Session	
Referenced Presentation LUT Sequence	(2050,0500)	sequence which provides references to the related Presentation LUT SOP Class/Instance pair. A single Item is present in this Sequence.	
>Referenced SOP Class UID	(0008,1150)	1.2.840.10008.5.1.1.23	
>Referenced SOP Instance UID	(0008,1155)	SOP Instance UID of the Presentation LUT provided by the printer in the N-CREATE-RSP of the Presentation LUT	

N-ACTION will result in submitting the print job for printing the specific Film Box (or film).

N-DELETE is used to delete a Film Box. This means that the complete Film Box SOP Instance hierarchy will be deleted.

5.2.8.1.3 Basic Grayscale Image Box SOP Class

Table 5-22 lists the supported DIMSE Service for the Basic Grayscale Image Box SOP Class:

Table 5-22 Services for the Basic Grayscale Image Box SOP Class

DIMSE Service Element	Purpose
N-SET	Set Image Attributes for a previously created Film Box

The Basic Image Box IOD is an abstraction of the presentation of an image and image related data in the image area of the film. The Basic Image Box IOD describes the presentation parameters and image pixel data which apply to a single image of a sheet film.

The Basic Grayscale Image Box SOP instance(s) is (are) created by the Printer at the time the N-CREATE of the Basic Film Box is processed, based on the value of the Basic Film Box attribute Image Display Format (2010,0010). The Basic Grayscale Image Box Instance UID's are returned in the N-CREATE-RSP of the Basic Film Box

Table 5-23 lists the supported N-SET Attributes for Basic Grayscale Image Box:

Table 5-23 Supported N-SET Attributes for the Basic Grayscale Image Box SOP Class -SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)	[1…24] The position of the image on the film, based on Image Display Format (2010,0010).	
Polarity	(2020,0020)	NORMAL; REVERSE	NORMAL
Requested Image Size	(2020,0030)	Width (x-dimension) in mm of the image to be printed. Calculated from attribute values Imager Pixel Spacing (0018,1164) & Columns (0028,0011) Sent when True Size printing is configured.	
Requested Decimate/Crop Behavior	(2020,0040)	CROP Sent when True Size printing is configured. Specifies whether image pixels are to be decimated or cropped if the image rows or columns is greater than the available printable pixels in an Image Box. Decimation means that a magnification factor <1 is applied to the image. The method of decimation shall be that specified by Magnification Type (2010,0060) or the SCP default if not specified Cropping means that some image rows and/or columns are deleted before printing. CROP means that some image rows and/or columns are to be deleted before printing. The specific algorithm for cropping shall be described in the SCP Conformance Statement.	CROP
Basic Grayscale Image Sequence	(2020,0110)		

Attribute Name	Tag	Values	Default
>Samples per Pixel	(0028,0002)	1	1
>Photometric Interpretation	(0028,0004)	MONOCHROME2	MONOCHROME2
>Rows	(0028,0010)	Original number of pixels of the image height	
>Columns	(0028,0011)	Original number of pixels of the image width	
>Bits Allocated	(0028,0100)	8 (if Bits Stored=8); 16 (If Bits Stored=12)	
>Bits Stored	(0028,0101)	8; 12 (recalculated to 12 when Bits stored in image is higher than 12)	
>High Bit	(0028,0102)	7; 11	
>Pixel Representation	(0028,0103)	0	0
>Pixel Data	(7FE0,0010)		

5.2.8.1.4 Printer SOP Class

Table 5-24 lists the supported DIMSE Services for the Printer SOP Class:

Table 5-24 Services for the Printer SOP Class

DIMSE Service Element	Purpose
N-GET	Retrieve printer information and status.

The Printer IOD is an abstraction of the DICOM printer and is the basic Information Entity to monitor the status of the printer. The Printer SOP Instance is created by the Printer during start-up and has a well-known SOP Instance UID (1.2.840.10008.5.1.1.17).

N-GET is used to retrieve an instance of the Printer SOP Class.
Enterprise Imaging Print SCU issues the command to obtain information about the current printer status. If the Printer reports a status of FAILURE, the print-job is switched to a failed state and the user informed.

Table 5-25 lists the supported N-GET Attributes for Printer SOP Class:

Table 5-25 Supported N-GET Attributes for the Printer SOP Class - SCU

Attribute Name	Tag	Value - Behavior
Printer Status	(2110,0010)	NORMAL; WARNING; FAILURE; If the Printer reports a status of FAILURE, the association is released by EI and the print-job is retried 4 times then switched to a failed state.
Printer Status Info	(2110,0020)	Printer dependent

Attribute Name	Tag	Value - Behavior
Printer Name	(2110,0030)	User defined name identifying the printer
Manufacturer	(0008,0070)	Manufacturer of the printer
Manufacturer Model Name	(0008,1090)	Manufacturer's model name of the printer
Device Serial Number	(0018,1000)	Manufacturer's serial number of the printer
Software Versions	(0018,1020)	Manufacturer's designation of software version of the printer
Date Last Calibration	(0018,1200)	Date when the printer was last calibrated
Time Last Calibration	(0018,1201)	Time when the printer was last calibrated

5.2.8.2 SCU of the Basic Color Print Management Meta SOP Class

The Basic Color Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in Table 5-26:

Table 5-26 Basic Color Print Management Meta SOP Classes

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Color Image Box	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

5.2.8.2.1 Basic Film Session SOP Class

See Section 5.2.8.1.1 Basic Film Session SOP Class for Basic Grayscale Print Management Meta SOP Class.

5.2.8.2.2 Basic Film Box SOP Class

See Section 5.2.8.1.2 Basic Film Box SOP Class for Basic Grayscale Print Management Meta SOP Class.

5.2.8.2.3 Basic Color Image Box SOP Class

Table 5-27 lists the supported DIMSE Service for the Basic Color Image Box SOP Class:

Table 5-27 Services for the Basic Color Image Box SOP Class - SCU

DIMSE Service Element	Purpose
N-SET	Set each Image Attributes for a previously created Film Box

The Basic Image Box IOD is an abstraction of the presentation of an image and image related data in the image area of the film. The Basic Image Box IOD describes the presentation parameters and image pixel data which apply to a single image of a sheet film.

The Basic Color Image Box SOP instance(s) is (are) created by the Printer at the time the N-CREATE of the Basic Film Box is processed, based on the value of the Basic Film Box

attribute Image Display Format (2010,0010). The Basic Color Image Box Instance UID's are returned in the N-CREATE-RSP of the Basic Film Box.

Table 5-28 lists the supported N-SET Attributes for Basic Color Image Box:

Table 5-28 Supported N-SET Attributes for the Basic Color Image Box SOP Class – SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)	[1…24] The position of the image on the film, based on Image Display Format (2010,0010).	
Polarity	(2020,0020)	NORMAL; REVERSE	NORMAL
Requested Image Size	(2020,0030)	Width (x-dimension) in mm of the image to be printed. Calculated from attribute values Imager Pixel Spacing (0018,1164) & Columns (0028,0011) Sent when True Size printing is configured.	
Requested Decimate/Crop Behavior	(2020,0040)	CROP Sent when True Size printing is configured.	
Basic Color Image Sequence	(2020,0111)		
>Samples per Pixel	(0028,0002)	3	3
>Photometric Interpretation	(0028,0004)	RGB	RGB
>Planar Configuration		1 (frame interleave)	1
>Rows	(0028,0010)	Original number of pixels of the image height	
>Columns	(0028,0011)	Original number of pixels of the image width	
>Bits Allocated	(0028,0100)	8	8
>Bits Stored	(0028,0101)	8	8
>High Bit	(0028,0102)	7	7
>Pixel Representation	(0028,0103)	0	0
>Pixel Data	(7FE0,0010)		

5.2.8.2.4 Printer SOP Class

See 'Printer SOP Class' for 'Basic Grayscale Print Management Meta SOP Class' in Section 5.2.8.1.4.

5.2.8.3 SCU of the Basic Annotation Box SOP Class – N/A

N/A. Even though the Core Server Print SCU proposes the Basic annotation SOP class in the association, it is not supported.

5.2.8.4 SCU of the Print Job SOP Class – N/A

N/A. Even though the Core Server Print SCU proposes the Print Job SOP class in the association, it is not supported.

5.2.8.5 SCU of the Presentation LUT SOP Class

The Presentation LUT Information Object is an abstraction of a Presentation LUT.

The Basic Film Box Information Object references the Presentation LUT (see Section 5.2.8.1.2).

If the Configuration Information Attribute (2010,0150) of the Basic Film Box IOD contains information similar to the Presentation LUT, then the Presentation LUT Attributes shall take precedence.

The output of the Presentation LUT is Presentation Values (P-Values). P-Values are approximately related to human perceptual response. They are intended to facilitate common input for both hardcopy and softcopy display devices.

The Presentation LUT is not intended to alter the appearance of the pixel values, as specified by the Photometric Interpretation (0028,0004) and Polarity (2020,0020).

The Printer shall use the Grayscale Standard Display Function as specified in PS 3.14 to convert the output of the Presentation LUT to density for printing.
Enterprise Imaging Print SCU specifies values for Illumination (2010,015E) and/or Reflected Ambient Light (2010,0160). The Printer applies the GSDF curve together with the density range to be printed, Min Density to Max Density, as it is specified at Film Box level.

Table 5-29 lists the supported DIMSE Services for the Presentation LUT SOP Class:

Table 5-29 Services for the Presentation LUT SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the Presentation LUT Instance
N-DELETE	Delete the Presentation LUT Instance

N-CREATE is issued by the Core Server Print SCU to create a Presentation LUT SOP Instance.

Table 5-30 lists the supported N-CREATE Attributes for Presentation LUT:

Table 5-30 Supported N-CREATE Attributes for the Presentation LUT SOP Class-SCU

Attribute Name	Tag	Values	Default
Presentation LUT Shape	(2050,0020)	IDENTITY	IDENTITY

N-DELETE is used to delete the Presentation LUT SOP Instance.

5.2.8.6 SCU of the Printer Configuration Retrieval SOP Class – N/A

N/A

5.2.8.7 SCP of the Basic Grayscale Print Management Meta SOP Class – N/A

N/A

5.2.8.8 SCP of the Basic Color Print Management Meta SOP Class – N/A

N/A

5.2.8.9 SCP of the Basic Annotation Box SOP Class – N/A

N/A

5.2.8.10 SCP of the Print Job SOP Class – N/A

Error! Reference source not found.N/A

5.2.8.11 SCP of the Presentation LUT SOP Class – N/A

Error! Reference source not found.N/A

5.2.8.12 SCP of the Printer Configuration Retrieval SOP Class – N/A

N/A

5.3 Supported DICOM Web Services

5.3.1 URI Web Service (WADO URI)

This section provides details regarding the URI Web Service. For an overview of the supported transactions see Table 1-8 URI Service.

5.3.1.1 Supported Web Media Types

5.3.1.1.1 DICOM Media Types

The supported DICOM Storage SOP Classes / Transfer Syntaxes are listed in Section 1.1 of this document.

5.3.1.1.2 Rendered Media Types

Table 5-31 lists the supported rendered Media types depending on the Media Type category:

Table 5-31 Supported Rendered Media Types

Category	Media Type	URI User Agent (Web Server)	URI Origin Server (Core Server)
Single Frame Image	image/jpeg	Y	Y
	image/gif	Y	Y
	image/png	Y	Y
	image/jp2	N	Y
Multi-Frame Image	image/gif	Y	Y (only the frame specified by frameNumber is returned)
Video	video/mpeg	Y	Y
	video/mp4	N	N
	video/H265	N	N
Text	text/html	Y	Y
	text/plain	N	N

Category	Media Type	URI User Agent (Web Server)	URI Origin Server (Core Server)
	text/xml	Y	Y
	text/rtf	N	N
	application/pdf	Y	N

5.3.1.2 Retrieve DICOM Instance Transaction - URI Web Service

5.3.1.2.1 User Agent

Supported by **Web Server** only

DICOM Instances retrieved via the URI Web service are for viewing only. They are not imported in Enterprise imaging

The URI Web Service user agent supports the Query Parameters listed in Table 5-32:

Table 5-32 Query Parameters for Retrieve DICOM Instance URI Web Service - User Agent

Query Parameter	Supported Values	Comments
requestType	WADO	
studyUID	<Study Instance UID>	
seriesUID	<Series Instance UID>	
objectUID	<SOP Instance UID>	
contentType	application/dicom	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "UA" column
charset	N/A	Not supported
anonymize	N/A	Not supported
transferSyntax		See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "UA" column

The URI Web Service User Agent does not support Header Fields

5.3.1.2.2 Origin Server

Supported by **Core Server** only.

The URI Web Service origin server receives GET requests for studies, series and instances containing query parameters and headers fields. Supported Values are listed in the query parameters and header fields tables (Table 5-33 and Table 5-34).

The URI is composed by a Base URI: see Section 6.3.1 for the Base URI of the Origin Server.

The URI Web Service origin server supports the Query Parameters listed in Table 5-33:

Table 5-33 Query Parameters for Retrieve DICOM Instance URI Web Service - Origin Server

Query Parameter	Supported Values	Comments
requestType	WADO	Must be present

Query Parameter	Supported Values	Comments
studyUID	<Study Instance UID>	Recommended
seriesUID	<Series Instance UID>	Recommended
objectUID	<SOP Instance ID>	Must be present
frameNumber	[1…]	Extract the image corresponding to the specified frameNumber from the Multiframe instance and return it
contentType	application/dicom	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "OS" column
charset	N/A	Not supported
anonymize	N/A	Not supported
rows	[0…4096]	0 means keep the original row number - **Recommended** If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
columns	[0…4096]	0 means keep the original row number - **Recommended** If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
transferSyntax	See Table 1-1	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "OS" column If the transferSyntax Query parameter is not specified, EI will use Explicit Little Endian when possible. See Transcoding of Transfer syntax table **Table 5-4**

The URI Web Service origin server supports the Header Fields listed in Table 5-34:

Table 5-34 Header Fields for Retrieve DICOM Instance URI Web Service - Origin Server

Header Field	Supported Values	Comments
Accept	application/dicom	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "OS" column
Accept-charset	N/A	Not supported

5.3.1.3 Retrieve Rendered Instance Transaction - URI Web Service

5.3.1.3.1 User Agent

Supported by **Web Server** only.

DICOM Instances retrieved via the URI Web service are for viewing only. They are not imported in Enterprise imaging.

The URI Web Service user agent supports the Query Parameters listed in Table 5-35:

Table 5-35 Query Parameters for Retrieve Rendered Instance URI Web Service - User Agent

Query Parameter	Supported Values	Comments
requestType	WADO	
studyUID	<Study Instance UID>	
seriesUID	<Series Instance UID>	
objectUID	<SOP Instance UID>	
frameNumber	[1…]	Extract the image corresponding to the specified frameNumber from the Multiframe instance and return it
contentType	image/jpeg image/gif image/png video/mpeg text/html text/xml application/pdf	See Section 5.3.1.1.2 for details
charset	N/A	Not supported
rows	[0…4096]	0 means keep the original row number. If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
columns	[0…4096]	0 means keep the original row number - recommended If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
annotation	N/A	Not supported
region	N/A	Not supported
windowCenter		
windowWidth		
imageQuality	N/A	Not supported
presentationSeriesUID		if presentationUID specified then presentationSeriesUID must be present
presentationUID		

The URI Web Service user agent does not support Header Fields

5.3.1.3.2 Origin Server

Supported by **Core Server** only.

The URI Web Service origin server receives GET requests for studies, series and instances containing query parameters and headers fields. Supported Values are listed in the query

parameters and header fields tables (Table 5-36 and Table 5-37**Error! Reference source not found.**).

The URI is composed by a Base URI: see Section 6.3.1 for the Base URI of the origin server.

The URI Web Service origin server supports Query Parameters listed in Table 5-36.

Table 5-36 Query Parameters for Retrieve Rendered Instance URI Web Service - Origin Server

Query Parameter	Supported Values	Comments
requestType	WADO	Must be present
studyUID	<Study Instance UID>	Recommended
seriesUID	<Series Instance UID>	Recommended
objectUID	<SOP Instance ID>	Must be present
frameNumber	[1…]	Extract the image corresponding to the specified frameNumber from the Multiframe instance and return it
contentType	image/jpeg image/gif image/png image/jp2 video/mpeg text/html text/xml See Section 5.3.1.1.2	See Section 5.3.1.1.2 for details If contentType is not specified, core server will return rendered images in jpeg format
charset	N/A	Not supported
annotation	N/A	Not supported
rows	[0…4096]	0 means keep the original row number. If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
columns	[0…4096]	0 means keep the original row number If number of rows / columns specified is higher than in the original image, the returned image will be magnified. If number of rows / columns specified is lower than in the original image, the returned image will be decimated (minified).
region	N/A	Not supported
windowCenter		
windowWidth		
imageQuality	N/A	Not supported
presentationSeriesUID	N/A	Not supported
presentationUID		

Query Parameter	Supported Values	Comments
overlays	N/A	Not supported. If present, Group 6000 overlays always applied in the rendered image

The URI Web Service origin server supports the Header Fields listed in Table 5-37:

Table 5-37 Header Fields for Retrieve DICOM Instance URI Web Service - Origin Server

Header Field	Supported Values	Comments
Accept	See Section 5.3.1.1.2	The origin server accepts the “Accept” header field but it does not use it. It uses the query parameter “contentType” to return the rendered image
Accept-charset	N/A	Not supported

5.3.2 Studies Web Service - WIP

This section provides details regarding the Studies Web Service. For an overview of supported transactions and resources see

Table 1-9 Study Service.

5.3.2.1 Supported Web Media Types – WIP

5.3.2.1.1 DICOM Media Types

The supported DICOM Storage SOP Classes / Transfer Syntaxes are listed in Section 1.1 of this document.

5.3.2.1.2 DICOM Bulkdata Media Types – WIP

WIP

5.3.2.1.3 Supported Rendered Media Types – WIP

WIP

5.3.2.2 Retrieve supported transaction (WADO-RS) - WIP

The Studies Web Service Retrieve Transaction is also known as WADO-RS.

5.3.2.2.1 User Agent – N/A

N/A

5.3.2.2.2 Origin Server - WIP

The Retrieve Transaction origin server receives GET requests to retrieve specific studies, series or instances.

The user agent specifies the Target Resource as part of the URI and the acceptable response Content-Type in the HTTP Header (i.e., dicom, dicom+xml, dicom+json, octet-stream, compressed pixel data).

The URI is composed by a Base URI: see Section 6.3.2.1 for the Base URI of the origin server.

5.3.2.3 Store Transaction (STOW-RS) – WIP

WIP

5.3.2.3.1 User Agent – WIP

WIP

For details regarding the IODs created by the system, see Annex A.

5.3.2.3.2 Origin Server – WIP

WIP

The Store Transaction origin server receives POST requests to store or append to an existing resource on the server.

The user agent specifies the Target Resource as part of the URI and encapsulates the data in a multipart request body with a proper Content-Type (i.e., BINARY, XML or JSON).

The URI is composed by a Base URI: see Base URI for the origin server in Section 6.3.2.2.

5.3.2.4 Search Transaction (QIDO-RS) – WIP

WIP

5.3.2.4.1 User Agent – N/A

N/A

5.3.2.4.2 Origin Server – WIP

WIP

The Search Transaction origin server receives GET requests to search for studies, series or instances.

The user agent specifies the Target Resource as part of the URI and the acceptable response Content-Type in the HTTP Header (i.e., dicom+xml or dicom+json).

The URI is composed by a Base URI: see Base URI for the origin server in Section 6.3.2.3.

5.3.3 Worklist Web Service – N/A

N/A

5.3.4 Non-Patient Instance Web Service – N/A

N/A

5.4 Media Service

5.4.1 File Set Creator (FSC)

The Core Server and Web Server supports creating the Basic Directory IOD as a File Set Creator as defined in Annex A.10.

For a list of supported Media Application Profiles, see Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview. All exported instances have transfer syntax set to Explicit VR Little Endian (transfer syntax UID 1.2.840.10008.1.2.1). If an instance stored in the Core Server AE associated with the Core Server Client AE does not have transfer syntax of Explicit VR Little Endian, then the Core Server Client AE will convert the object into Explicit VR Little Endian.

5.4.1.1 Core Server File Set Creator (FSC)

The Core Server Client Application Entity (Diagnostic Desktop / Acquisition Desktop) exports exams to CD-R storage medium. It is associated with the local real-world activity “Save to Media”. A DICOM viewer is exported along with the exams. “Save to Media” is performed upon user request for selected patients, studies, series and instances (images, presentation states and other non-image objects). If the content of the current selection exceeds the capacity of a single CD-R medium an error dialog will be shown notifying the user that export to this medium is not possible. The user will be prompted to insert an empty CD-R for each export job. The contents of the export job will be written together with a corresponding DICOMDIR and a DICOM viewer to a single-session CDR. Writing in multi-session mode is not supported. The user can cancel an export job in the job queue.

5.4.1.2 Web Server File Set Creator (FSC)

The Web Server supports export of a study to a ZIP archive following the data model in DICOM part 10, on behalf of a user request in XERO Viewer. The user has the option to encrypt the ZIP file with a given password. The resulting archive may be extracted by the user, and then imported by a device that is compliant with DICOM part 10. Export-FSC does not provide a native E-Mail service but relies on the end-user to attach the ZIP File provided in an E-Mail to the intended destination.

5.4.2 File Set Reader (FSR)

The Core Server supports the Media Application Profiles listed in Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

The Core Server Client (Diagnostic / Acquisition / Clinician desktop) act as a File-Set Reader when reading exams from an interchange media. It retrieves the references to the exam objects based on the DICOM Directory structure (DICOMDIR) if available or search for DICOM files on the media and then presents a list of all the available exams to the user. Then the user can select a study and display the objects using the location references retrieved from the DICOM Directory structure.

The user can also import exams from an interchange media to its associated Core Server AE. It retrieves the references to the exam objects based on the DICOM Directory structure. Then using the location references retrieved, it transmits the objects to its associated Core Server AE via DICOM C-Store.

To display or process DICOM Instances contained on the Media, see Section 5.2.5.2.

5.4.3 File Set Updater (FSU) – N/A

N/A

5.5 Real Time Video Service – N/A

N/A

5.6 Cross Service Considerations - TBC

TBC

5.7 Specific Character Sets - TBC

TBC

6 CONFIGURATION

Most of the Configuration can be performed through the Administrator Desktop or the Web interface tool called ei-tools.

Throughout all subsections the following Values can be used in the "Configurable" column:

- USER: The parameter is configurable by the user having administrator rights
- SERVICE: The parameter is configurable only by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

6.1 General Configuration Parameters

Table 6-1 lists general configuration parameters applicable across all supported DICOM Services.

Table 6-1 General Configuration Parameters

Parameter	Configurable	Default Value	Comments
General Parameters			
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Application-Level timeout)	SERVICE	60s (60000ms)	
Timeout waiting for a response to an Association release request. (Application Level Timeout)	SERVICE	60s (60000ms)	
TCP/IP Settings			
TCP/IP Send Buffer – PDU size	FIXED	16378Bytes	
TCP/IP Receive Buffer – PDU Size	FIXED	16378 Bytes	
DICOM Services Parameters			
Maximum number of simultaneous Associations accepted	SERVICE	512	Core Server
		30	Web Server
DIMSE idle timeout	SERVICE	5min (300000ms)	
DIMSE Response Timeout	SERVICE	5min (300000ms)	
DIMSE Retrieve Timeout	SERVICE	5min (300000ms)	Retrieve only.
Default AET for All DICOM services except DICOM print	SERVICE	<DefaultAETitle>	Defined during installation
Specific Character Set	USER		

6.2 Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.

In order to identify whether the Core Server is an SCP and / or an SCU, the following applies:

- SCP: The (Secured) Local Called AET and Remote Calling AET parameters are present.
- SCU: The (Secured) Local Calling AET and Remote Called AET parameters are present.

6.2.1 Basic Worklist Management Service Configuration

Table 6-2 lists Worklist Service configuration parameters:

Table 6-2 Worklist Service Parameters

Local Worklist Configuration Parameters - Worklist Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	SERVICE	<DefaultAETitle> <DefaultAETitle>_DMWL	The <DefaultAETitle> is generated randomly and can be modified during installation.
Port	FIXED	104	
TLS-Secured Port	FIXED	2762	
Remote Configuration Parameters - Worklist Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	USER		
Host	USER		
Patient ID Issuer	USER	“empty”	In case patient has more than one Patient ID/issuer, this parameter allows to return the Patient ID corresponding to the defined Patient ID issuer in the DMWL C-FIND-RSP. When not set, it returns the first Patient ID/Issuer that was received in the ORM HL7 message

6.2.2 Modality Performed Procedure Step Service Configuration

Table 6-3 lists Modality Performed Procedure Step Service configuration parameters:

Table 6-3 MPPS Service Parameters

Local Configuration Parameters - MPPS Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	SERVICE	<DefaultAETitle> <DefaultAETitle>_DMWL	The <DefaultAETitle> is generated randomly and can be modified during installation.
Port	FIXED	104	
TLS-Secured Port	FIXED	2762	
Remote Configuration Parameters - MPPS Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	USER		
Host	USER		

Rely on MPPS complete sent by modality	USER	“unchecked”	If checked the PPS will be considered as completed when the modality sends the MPPS N-SET COMPLETED

6.2.3 Unified Worklist and Procedure Step Service Configuration – N/A

N/A

6.2.4 Instance Availability Notification Service Configuration – N/A

N/A

6.2.5 Storage Service Configuration

Table 6-4 lists Storage Service configuration parameters:

Table 6-4 Storage Service Parameters

Local Configuration Parameters - Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	<DefaultAETitle>	The <DefaultAETitle> is generated randomly and can be modified during installation.
Called AE Title (SCP)	SERVICE	<DefaultAETitle>	The <DefaultAETitle> is generated randomly and can be modified during installation A List of default AE Titles with a suffix are also generated. They can be used for specific use cases. See below
		<DefaultAETitle>_PREVER	New studies not requiring verification (since already verified)
		<DefaultAETitle>_PRIORS	Previously read studies requiring archiving
		<DefaultAETitle>_MIG	Unverified studies migrated from a legacy PACS
		<DefaultAETitle>_IMP	Marks studies as Import for Reading
		<DefaultAETitle>_IMPPRI	Marks studies as Import as Comparison
		<DefaultAETitle>_GUEST	Guest Studies for viewing from external system not imported in the database
Port	FIXED	104	For Guest studies to be displayed only (not imported in DB/cache), the default port is 110
TLS-Secured Port	FIXED	2762	
Remote Configuration Parameters - Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	USER		
Called AE Title (SCP)	USER		
Port	USER	104	Outbound communication cannot be done on TLS-Secured port channel. It will be implemented in a future iteration

Host	USER		
Inbound PID / issuer to use	USER	“empty”	In case the selected remote Storage SCU does not send an issuer of Patient ID, you can define a default inbound Patient ID issuer.
Outbound Issuer of Patient ID default	USER	“empty”	In case there are several PID/issuers for the study to send to the remote storage SCP, the default PID/issuer can be selected to be sent as the primary Patient ID to the selected remote storage SCP
Outbound ILE Transfer only	USER	“unchecked”	When checked, only ILE transfer syntax will be negotiated when sending out studies to the selected Remote storage SCP.
Outbound filtering of Storage SOP Classes	SERVICE		Can filter which SOP classes to send (or not) to the selected remote destination

6.2.6 Storage Commitment Service Configuration

Table 6-5 lists Storage Commitment Service configuration parameters:

Table 6-5 Storage Commitment Service Parameters

Local Configuration Parameters - Storage Commitment Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	<DefaultAETitle>	The <DefaultAETitle> is generated randomly and can be modified during installation.
Called AE Title (SCP)	SERVICE	<DefaultAETitle> <DefaultAETitle>_PRIORS	The <DefaultAETitle> and <DefaultAETitle>_PRIORS are generated randomly and can be modified during installation
Port	SERVICE	104	
TLS-Secured Port	FIXED	2762	
Delay to send N-ACTION-RQ (SCU)	SERVICE	300s	The Core server will wait 5 minutes After the sending of a study to the remote archive SCP (closing of the storage association) to send the Storage Commit N-ACTION-RQ. This delay applies to all defined remote DICOM archive
Delay to send N-EVENT-REPORT-RQ (SCU)	FIXED	No delay	Right after the Core server received an N-ACTION-RQ and returned an N-ACTION-RSP, it will try to send the N-EVENT-REPORT-RQ in the same association to the storage commit SCU device.
N-EVENT-REPORT on same Association (SCU)	FIXED	Synchronous Asynchronous fall back	Right after the Core server received an N-ACTION-RQ and returned an N-ACTION-RSP, it will try to send the N-EVENT-REPORT-RQ in the same association to the storage commit SCU device. (**synchronous**) If the Storage commit SCU device closes the N-ACTION association immediately after it received the N-ACTION-RSP, The N-EVENT-REPORT-RQ will fail. However, the Core server will then **automatically** open a new Association to send the N-EVENT-

			REPORT-RQ to the Storage Commit SCU device (**asynchronous** fall back)
N-EVENT-REPORT on same Association (SCP)		Asynchronous	After the Core Server system sends an N-ACTION to the Storage commit SCP, it closes the N-ACTION association, so it expects to receive the N-EVENT-REPORT in a separate Association (**Asynchronous**)
Remote Configuration Parameters - Storage commitment Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	FIXED		This is the same AET as the one configured for the Remote DICOM device **Storage Service**. After the Core Server will receive the N-ACTION-RQ and returned the N-ACTION-RSP, if the association is immediately closed by the storage commit SCU device, the Core Server will use this AET as Called AET to open the association to send the N-EVENT-REPORT-RQ
Called AE Title (SCP)	FIXED		This is the same AET as the one configured for the Remote DICOM Archive **Storage Service**
port	FIXED		This is the same port as the one configured for the Remote DICOM Archive **Storage Service**
Host	SERVICE		This is the same host as the one configured for the Remote DICOM Archive **Storage Service**

6.2.7 Query/Retrieve Service Configuration

Table 6-6 lists Query/Retrieve Service configuration parameters:

Table 6-6 Query/Retrieve Service Parameters

Local Configuration Parameters - Query/Retrieve Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	SERVICE	<DefaultAETitle>	The <DefaultAETitle> is generated randomly and can be modified during installation. The same Calling AET is used for Query (C-FIND) and Retrieve (C-MOVE)
Called AE Title (SCP)	SERVICE	<DefaultAETitle>	The <DefaultAETitle> is generated randomly and can be modified during installation. The same Called AET is used for Query (C-FIND) and Retrieve (C-MOVE)
Port	FIXED	104	
TLS-Secured Port	FIXED	2762	
Send C-MOVE-RSPs with Pending Status to the C-MOVE SCU during the retrieve process	SERVICE	5s (5000ms)	In case the C-STORE triggered by the C-MOVE last more than 5s, a C-MOVE-RSP pending is sent to the remote DICOM device every 5 seconds
Remote Configuration Parameters - Query/Retrieve Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	USER		

Called AE Title (SCP)	USER		
Port	USER	104	
Host	USER		
Inbound Patient ID issuer to use	USER		In case the selected remote Query SCU does not send an issuer of Patient ID, you can define a default inbound Patient ID issuer.

6.2.8 Print Management Service Configuration

Table 6-7 lists Print Management Service configuration parameters:

Table 6-7 Print Management Service Parameters

Local Configuration Parameters - Print Management Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (SCU)	FIXED	AGFA_PACS	
Remote Configuration Parameters - Print Management Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	USER		
Port	USER	104	
Host	USER		
printer template	USER		Pre-defined printer templates from several DICOM printer brand can be selected in a drop-down list.
Film sizes supported by the Print SCP	USER	All film sizes supported for the selected printer template	Uncheck the film sizes which are not used
Printer Presets	USER		Configure default print parameters (Dmax, Dmin etc…) for the selected remote printer. Several presets can be configured for the same remote printer

6.3 Configuration of DICOM Web Services

The tables in the following subsections show the configuration parameters required for DICOM Web Services.

To identify whether The Core Server of Web server is an origin server and / or a user agent, the following applies:

- Origin server: The (Secured) Local <Transaction Name> URL is present at the local configuration parameters.
- User agent: The (Secured) Remote <Transaction Name> URL is present at the Remote configuration parameters.

6.3.1 URI Web Service Configuration

Table 6-8 lists the configuration parameters required for URI Web Service.

Table 6-8 URI Web Service Parameters

Local Configuration Parameters - URI Web Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Local Retrieve Imaging Doc Set URL. (Base URI)	FIXED	http://<CoreServerHost>:<port>/wado/	
Port	FIXED	80	If used, it will be redirected to secured port
Secured Local Retrieve Imaging Doc Set URL (Base URI)	FIXED	https://<CoreServerHost>:<Securedport>/wado/	
Secured Port	SERVICE	443	
Remote Configuration Parameters - URI Web Service			
Parameter	**Configurable**	**Default**	**Comments**
Remote Retrieve Imaging Doc Set URL	SERVICE		
Port	SERVICE		
Secured Remote Retrieve Imaging Doc Set URL	SERVICE		
Secured Port	SERVICE		

6.3.2 Studies Web Service Configuration – WIP

6.3.2.1 Retrieve Transaction (WADO-RS) Configuration - WIP

WIP

6.3.2.2 Store Transaction (STOW-RS) Configuration – WIP

WIP

6.3.2.3 Search Transaction (QIDO-RS) Configuration – WIP

WIP

6.3.3 Worklist Web Service Configuration – N/A

N/A

6.3.4 Non-Patient Instances (NPI) Web Service Configuration – N/A

N/A

6.4 Configuration of Media Storage Service

Table 6-9 lists configuration parameters for the Media Storage service:

Table 6-9 Media Storage Service Parameters

Local Configuration Parameters - Media Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Source Application Entity Title	FIXED		Copied from the original object if present

6.5 Configuration of Real Time Video Service – N/A

N/A

6.6 Configuration of Audit Trail – Syslog

Table 6-10 lists configuration parameters for the Audit Trail Originator:

Table 6-10 Audit Trail Originator Parameters

Originator Audit Trail Message Transmission-SYSLOG Parameters			
Parameter	**Configurable**	**Default Value**	**Comments**
Remote Port number	SERVICE		Can configure only one Remote ARR
Remote secured port number	SERVICE		Done by checking SSL box
Remote Host name/IP	SERVICE		
UDP Protocol	N/A		
TLS Protocol	FIXED	TLS 1.2	
TLS Cypher Suites	SERVICE		Select Cypher suite in drop-down list

Table 6-11 lists configuration parameters for the Audit Trail Collector:

Table 6-11 Audit Trail Collector Parameters

Collector Audit Trail Message Transmission-SYSLOG Parameters			
Parameter	**Configurable**	**Default Value**	**Comments**
Local Listening Port Number	FIXED	6514	
Local Listening Secured port number	FIXED	6514	
Local Host Name/IP	FIXED	<CoreServerHost>	
UDP Protocol	N/A		UDP not supported
TLS Protocol	FIXED	TLS 1.2	

7 NETWORK AND MEDIA COMMUNICATION DETAILS

7.1 General

The cross interaction between Enterprise Imaging AEs and Real-World devices is depicted in the diagrams below.

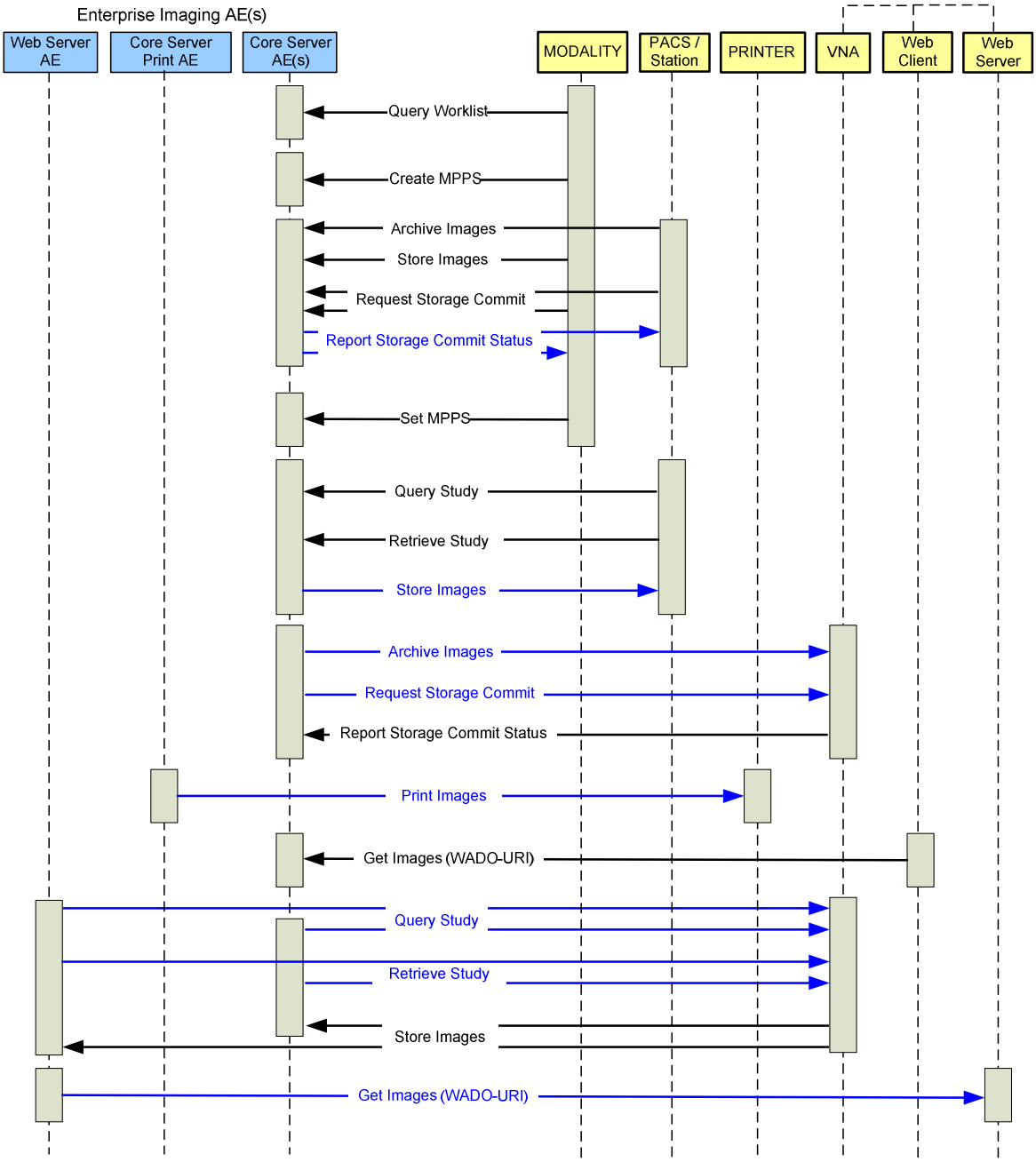

Figure 7-1 Real-World Activity and Cross AE interaction

7.1.1 General Association Parameters

Table 7-1 lists Association parameters applicable to all AEs on the system.

Table 7-1 General Association Parameters

	Name	Value
Networking Services	Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	See AE Specific Association parameters
	Implementation Version Name	See AE Specific Association parameters
	Maximum PDU Length	16378 Bytes (Core Server AE)
		65542 Bytes (Core Server Print AE)
	ARTIM Timeout	60 sec (60000 ms)
	Maximum number of simultaneous Associations as Association Initiator	50 per node
	Maximum number of simultaneous Associations as Association Acceptor	512 per node (Core Server AE)
		30 per node (Web Server AE)
	Maximum number of outstanding asynchronous Transactions	20 (Core Server AE)
		15 (Web Server AE)
Media Services	File Meta Information Version	00\01
	Implementation Class UID	1.2.40.0.13.1.3
	Implementation Version Name	dcm4che-5.31.0.a (Core Server AE)
		dcm4che-2.0 (Web Server AE)
Web Services	Maximum number of connections supported as Server	

7.2 Specifications

7.2.1 Core Server AE Application Entity

7.2.1.1 Sequencing of Real-World Activities for Core Server AE

7.2.1.1.1 Sequencing of Real-World Activities for Core Server AE acting as PACS

The **figure 7.2** depicts a scheduled workflow real world activity involving an acquisition modality querying the MWL from Enterprise Imaging, sending MPPS and storing images to that same Enterprise Imaging PACS which in turn archive the images to an external VNA.

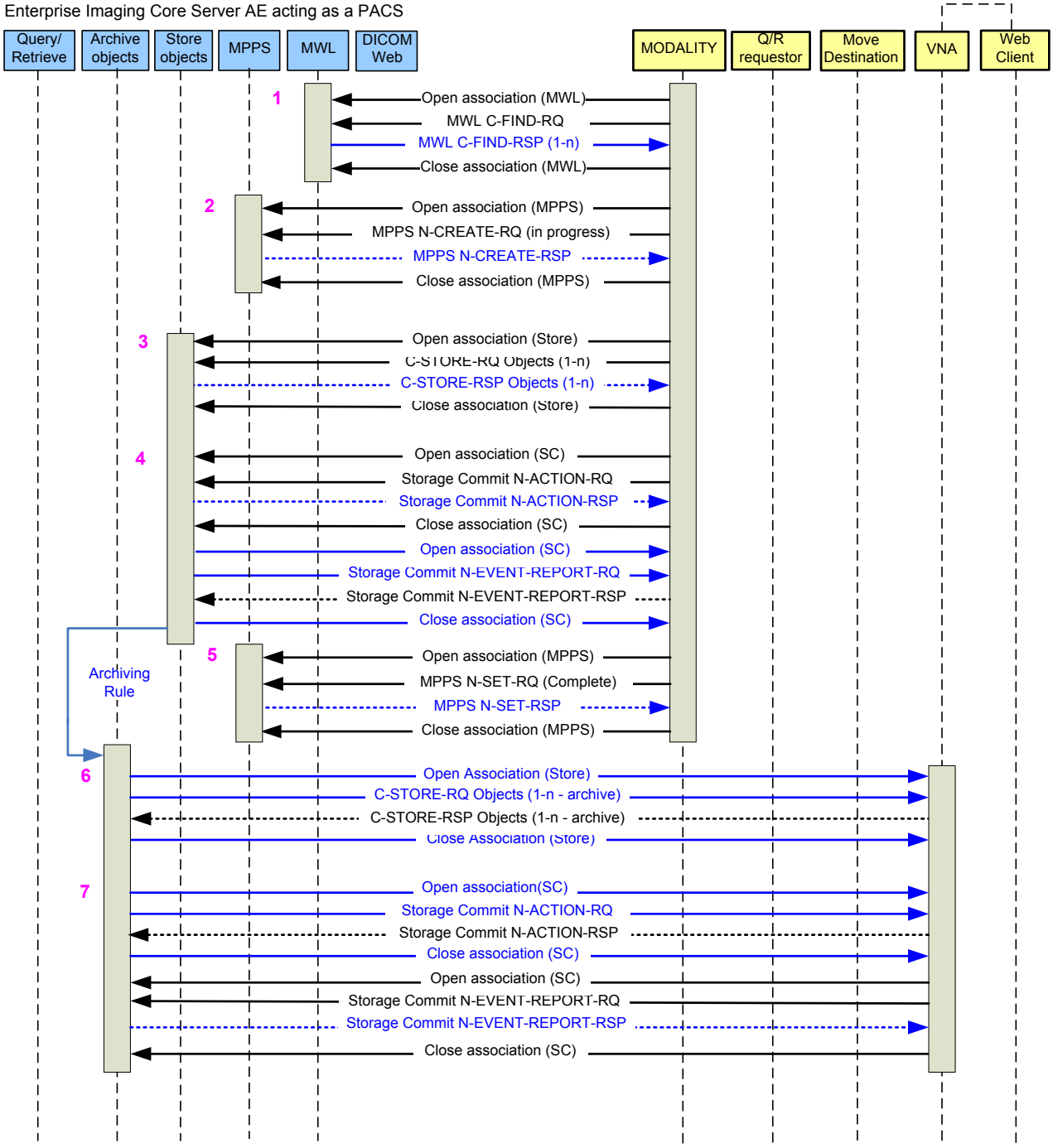

Figure 7-2 Sequencing of Real-World Activities for Core Server AE acting as a PACS - 1

Here is the typical sequence of the Enterprise Imaging (EI) Core Server AE for Real-World activity when **acting as a PACS** as depicted in the figure above

1 - The Modality open an MWL association to query (C-FIND) the worklist (e.g for today). The Core Server AE MWL returns the scheduled Procedure Steps (SPS) for today in the C-FIND-RSP. The modality then closes the MWL association.

2 - The modality picks the appropriate returned SPS and start the Exam. This triggers the opening of the MPPS association to send the status of the SPS (N-CREATE - IN PROGRESS). The SPS is flagged as started in EI. The modality then closes the MPPS association.

3 – Once images are acquired the Modality open a storage association to store all acquired images to the Core Server AE (C-STORE) and then close the storage association.

4 - Optionally, the modality can request a Storage Commit (SC) of the stored images by the Core Server AE: The modality open an SC association and send a commit request (N-ACTION). And then close the association. The Core Server AE will then commit the images and report it to the modality by opening a SC association and send an N-EVENT-REPORT. Then EI closes the association.

5 - The modality notifies the Core Server AE that the status of the SPS is completed by opening an MPPS association and sending N-SET COMPLETE and then close the association. The SPS is flagged as completed in EI. Note that this notification of completed exam could be sent after all images are acquired and before they are stored to EI.

6 - EI can archive the studies to an external VNA according to predefined rules. The Core Server AE opens a storage association and archive (C-STORE) the images to the external VNA and then close the storage association.

7 - EI request a Storage Commit (SC) of the archived images by the VNA: The Core Server AE open an SC association and send a commit request (N-ACTION). And then close the association. The VNA will then commit the images and report it to the Core server AE by opening a SC association and send an N-EVENT-REPORT. Then the VNA closes the association.

The **figure 7.3** depicts a Real-World activity involving an external Workstation (Q/R requestor / Move destination) / Web Client querying and retrieving images from Enterprise Imaging PACS.

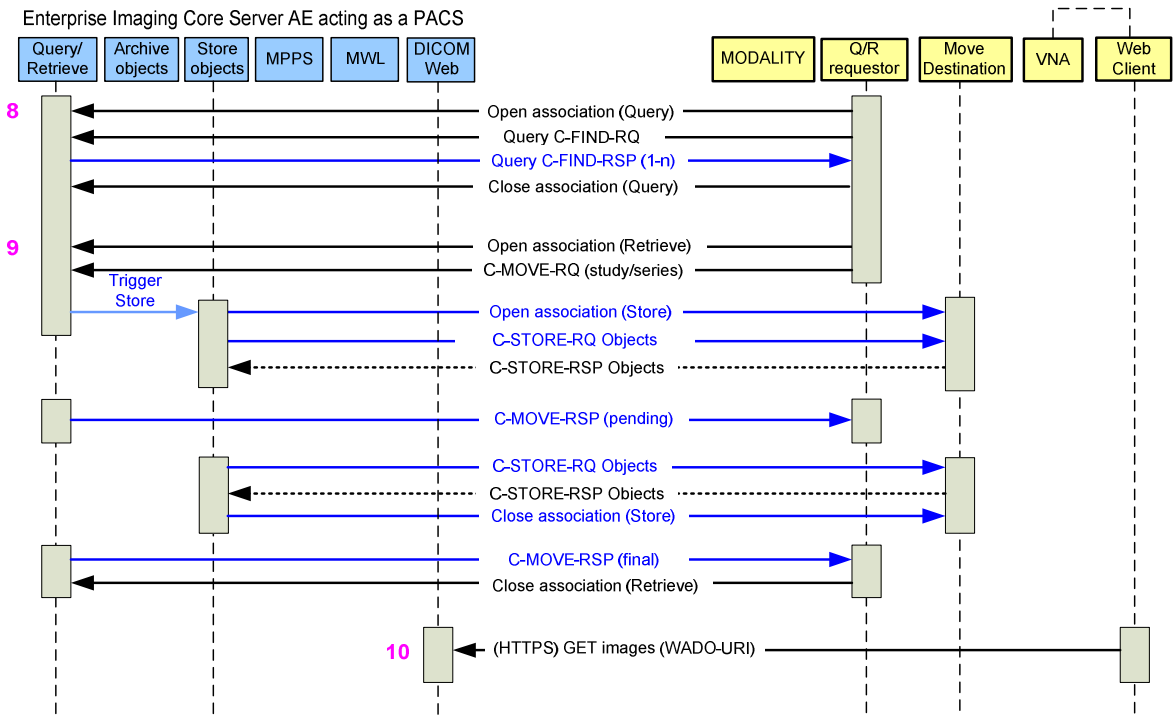

Figure 7-3 Sequencing of Real-World Activities for Core Server AE acting as a PACS - 2

Here is the typical sequence of the Enterprise Imaging (EI) Core Server AE for Real-World activity when an external workstation / PACS Query/retrieve the images from Enterprise Imaging **acting as a PACS** as depicted in the figure above:

8 – External workstations or PACS (Q/R Requestor) search for studies or Series in EI by opening a QUERY association and sending a C-FIND with matching criteria to the Core Server AE. EI returns the matching studies / series. Then the Q/R requestor closes the association.

9 - External Workstations or PACS (Q/R Requestor) retrieve the matching studies / series by opening a retrieve association and sending a C-MOVE to the Core Server AE. In the C-MOVE-RQ the move destination AE is specified. This triggers the Core Server AE to open a store association to the Move Destination AE and C-STORE the images. The Core server AE sends C-MOVE-RSP with status “pending” every 5 seconds to the Q/R requestor (if the storage of images last more than 5 seconds). Once the last C-STORE is sent to the Move Destination AE, the Core Server AE closes the store association with the Move Destination AE and sends a final C-MOVE-RSP with status “success” to the Q/R Requestor. Then the Q/R Requestor closes the retrieve association with the Core Server AE.

10 – An external DICOM Web Client acting as a User Agent can retrieve images by sending HTTPS GET requests to the Core Server URI Web Service origin server. (WADO-URI).

The **figure 7.4** depicts a Real-World activity involving Enterprise Imaging acting as a PACS Querying and retrieving images from an External VNA

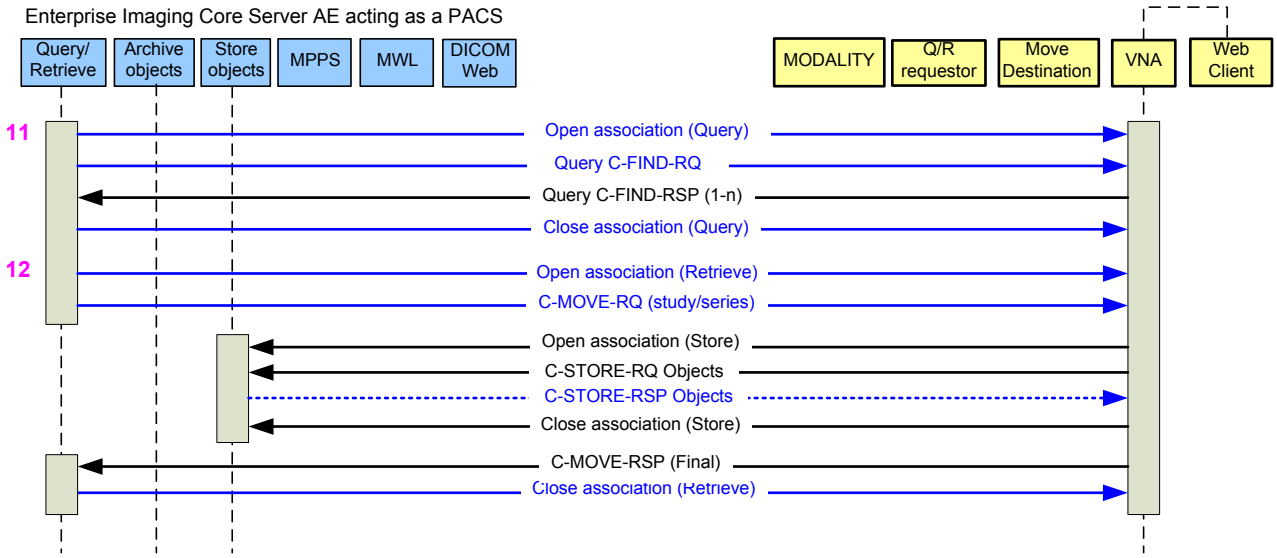

Figure 7-4 Sequencing of Real-World Activities for Core Server AE acting as a PACS - 3

Here is the typical sequence of the Enterprise Imaging (EI) Core Server AE for Real-World activity when Enterprise Imaging acting as a PACS Query/retrieve the images from an external VNA as depicted in the figure above:

11 – EI can search for studies originating from other PACS systems in the VNA: The Core Server AE (Query/retrieve) search for studies in the VNA by opening a QUERY association and sending a C-FIND with matching criteria to the VNA. The VNA returns the matching studies. Then the Core Server AE closes the association.

12 – EI can retrieve studies found in step 10. It can also retrieve its own studies in case they are not in EI cache anymore (Store & Remember functionality) and an EI user wants to display them. The Retrieval is performed by opening a retrieve association and sending a C-MOVE to the VNA. In the C-MOVE-RQ the move destination of the Core Server AE is specified. This triggers the VNA to open a store association to the Move destination of the Core Server AE and C-STORE the images. Once the last C-STORE is sent to the Move destination of the Core Server AE, the VNA closes the store association and sends a final C-MOVE-RSP with status “success” to the Core Server AE. Then the Core Server AE closes the retrieve association with the VNA.

7.2.1.1.2 Sequencing of Real-World Activities for Core Server AE acting as VNA

The **figure 7.5** depicts a Real-World activity involving an external PACS archiving to Enterprise Imaging acting as a VNA.

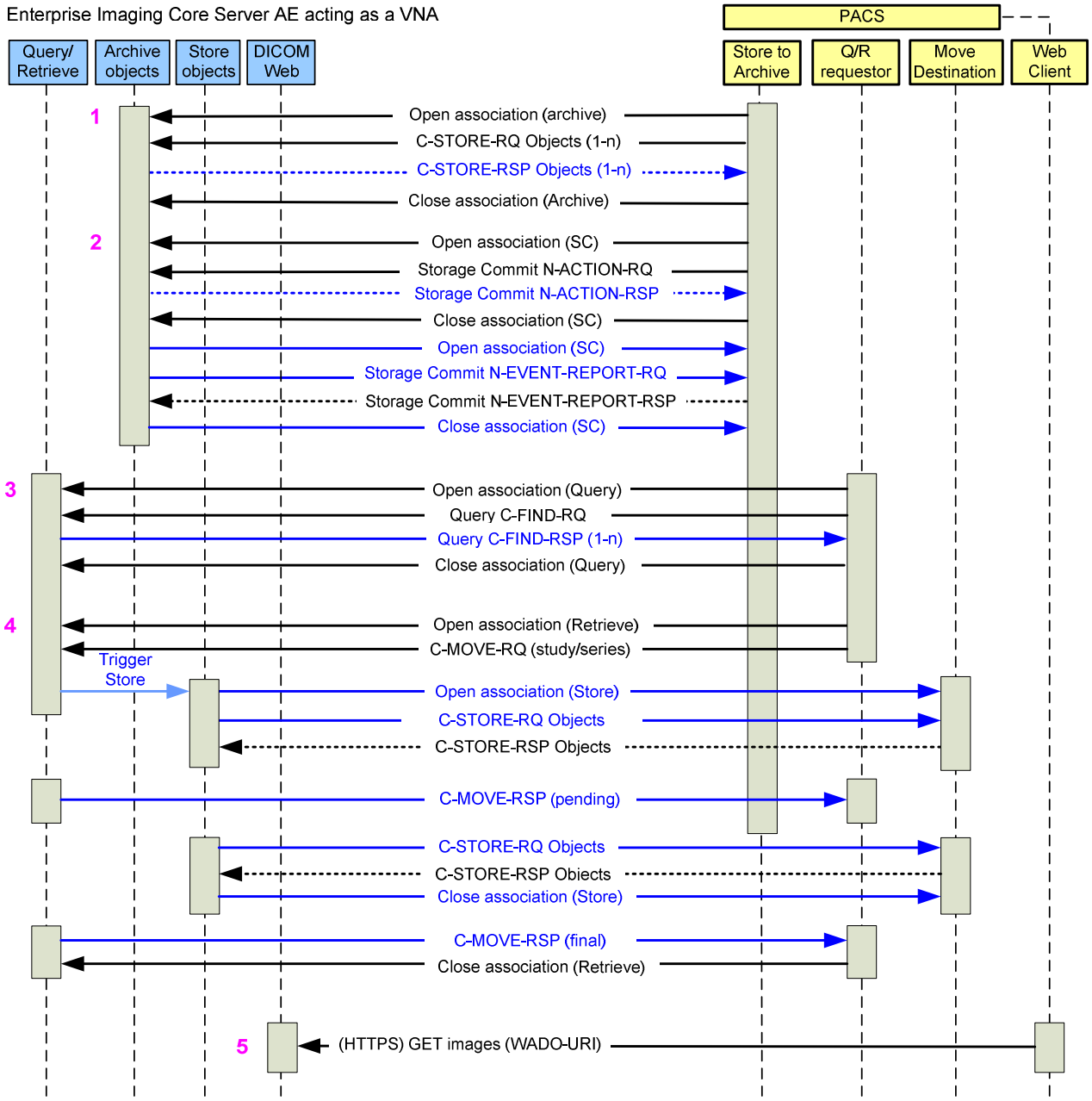

Figure 7-5 Sequencing of Real-World Activities for Core Server AE acting as a VNA

Here is the typical sequence of the Enterprise Imaging (EI) Core Server AE for Real-World activity when **acting as a VNA** as depicted in the figures above:

1 - The PACS opens a store association to archive (C-STORE) images and other DICOM objects to the Archive Core Server AE. The PACS then closes store association.

2 - The PACS can request a Storage Commit (SC) of the archived images by the Archive Core Server AE: The PACS opens an SC association and send a commit request (N-ACTION). And then close the association. The Core Server AE will then commit the images and report it to the PACS by opening a SC association and send an N-EVENT-REPORT. Then EI closes the association.

3 – The PACS or an External workstation (Q/R Requestor) search for studies or Series in EI by opening a QUERY association and sending a C-FIND with matching criteria to the Core Server AE. EI returns the matching studies / series. Then the Q/R requestor closes the association.

4 - The PACS or Workstation (Q/R Requestor) retrieve the matching studies / series by opening a retrieve association and sending a C-MOVE to the Core Server AE. In the C-MOVE-RQ the move destination AE of the PACS / Workstation is specified. This triggers the Core Server AE to open a store association to the PACS or Workstation Move Destination AE and C-STORE the images. The Core server AE sends C-MOVE-RSP with status "pending" every 5 seconds to the Q/R requestor (if the storage of images last more than 5 seconds). Once the last C-STORE is sent to the Move Destination AE, the Core Server AE closes the store association with the PACS / Workstation Move Destination AE and sends a final C-MOVE-RSP with status "success" to the Q/R Requestor. Then the PACS / Worksation Q/R Requestor closes the retrieve association with the Core Server AE.

5 – An external DICOM Web Client acting as a User Agent can retrieve images by sending HTTPS GET requests to the Core Server URI Web Service origin server. (WADO-URI)

7.2.1.2 Association Parameters of Core Server AE

Table 7-2 lists only Association parameters applicable to Core Server AE which are not already mentioned in the General Association Parameters **Table 7-1**

Table 7-2 Association Parameters for Core Server AE

Networking Services	Name	Value
Query as SCU	Implementation Class UID	1.2.40.0.13.1.1
	Implementation Version Name	dcm4che-2.0
Query as SCP Retrieve as SCU/SCP Storage and Storage commitment as SCU/SCP MWL and MPPS as SCP	Implementation Class UID	1.2.40.0.13.1.3
	Implementation Version Name	EntImaging-8.3.2

7.2.1.3 Association Initiation

This section details the Association policies of the Application Entity when it is initiating an Association.

7.2.1.3.1 Real-World Activity Query/Retrieve

- Enterprise Imaging Core Server AE proposes the Query SOP classes / Transfer Syntaxes supported as SCU in Table 1-6.

  Each Presentation Context contain one Transfer Syntax in the Association Initiation.

- Enterprise Imaging Core Server AE proposes the Retrieve SOP classes / Transfer Syntaxes supported as SCU in Table 1-6.

  One Presentation Context containing the 3 supported Transfer Syntaxes is proposed in the Association Initiation.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity Query/Retrieve are described in Table 7-4.

Table 7-3 Extended Negotiation for Query/Retrieve of Core Server AE - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Query			
Applicable to the following Query Retrieve - FIND SOP Classes: Patient Root, Study Root, Patient/Study Only	Relational queries	Y	1
	Date-time matching	N	N/A
	Fuzzy semantic matching of person names	N	N/A
	Timezone query adjustment	N	N/A
	Enhanced Multi-Frame Image Conversion	N	N/A
Retrieve			
Applicable to the Study Root Query Retrieve - MOVE SOP Class.	Relational retrieval	N	N/A
	Enhanced Multi-Frame Image Conversion	N	N/A
	Timezone query adjustment	N	N/A

7.2.1.3.2 Real-World Activity Storage

The Core Server AE proposes all SOP classes included in the study / Series to be transmitted in the same association. See section 5.2.5.1.1. for the Transfer Syntax proposal policy. Each Presentation Context contains one Transfer Syntax in the Association Initiation

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity Storage are described in Table 7-4.

Table 7-4 Extended Negotiation for Storage of Core Server AE - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Storage			
	Level of support	N	N/A
	Level of Digital Signature support	N	N/A
	Element Coercion	N	N/A

7.2.1.3.3 Real-World Activity Archive

When the remote storage SCP to which the Core Server AE transmit the study /Series is defined as a “DICOM archive”, the Core Server AE uses the “Store and remember to external Archive (VNA)” functionality, as such, it implements the Storage Commitment-SCU to the VNA Storage Commitment-SCP.

The Core Server AE Storage association initiation to the “DICOM Archive” device is already described in the previous section 7.2.1.3.2

Five minutes after the storage association is closed (all instances of the studies are stored to the VNA), the Core Server AE initiates the association for the Storage Commitment Push Model with Implicit VR Little Endian Transfer Syntax. And it closes the association as soon it receives the N-ACTION-RSP from the VNA Storage commitment SCP. Meaning, the Core Server AE does not expect to receive the N-EVENT-REPORT-RQ in that same association.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity Archive are already document in Tabled in Table 7-4. For the Storage part. For the Storage commitment part, Extended Negotiation is not applicable.

7.2.1.4 Association Acceptance

This section details the Association policies of the Application Entity when it is the acceptor of an Association.

7.2.1.4.1 Real-World Activity MWL and MPPS

The Core Server AE accepts Association for the MWL and MPPS SOP classes / Transfer Syntaxes listed in Table 1-5

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity MWL and MPPS are described in Table 7-8.

Table 7-5 Extended Negotiation for MWL and MPPS of Core Server AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Requested Value
Modality Worklist			
Modality Worklist Information Model - FIND (1.2.840.10008.5.1.4.31)	Fuzzy semantic matching of person names	N	N/A
	Timezone query adjustment	N	N/A

7.2.1.4.2 Real-World Activity Query / Retrieve

The Core Server AE accept Association for the Query/Retrieve SOP classes / Transfer Syntaxes supported as SCP listed in Table 1-6

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity Query/Retrieve are described in Table 7-6.

Table 7-6 Extended Negotiation for Query/Retrieve of Core Server AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Requested Value
Query			
Applicable to the following Query Retrieve - FIND SOP Classes: Patient Root, Study Root, Patient/Study Only.	Relational queries	Y	1
	Date-time matching	N	N/A
	Fuzzy semantic matching of person names	N	N/A

SOP Class	Extended Negotiation	Support	Requested Value
	Timezone query adjustment	N	N/A
	Enhanced Multi-Frame Image Conversion	N	N/A
Retrieve			
Applicable to the following Query Retrieve - MOVE SOP Classes: Patient Root, Study Root.	Relational retrieval	Y	1
	Enhanced Multi-Frame Image Conversion	N	N/A
	Timezone query adjustment	N	N/A

7.2.1.4.3 Real-World Activity Storage

The Core Server AE accepts Association for the Storage SOP classes / Transfer Syntaxes supported as SCP listed in Table 1-1

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity Storage are described in Table 7-7.

Table 7-7 Extended Negotiation for Storage of Core Server AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Requested Value
Storage			
Applicable to all Storage SOP Classes listed under Table 1-1	Level of support	N	N/A
	Level of Digital Signature support	N	N/A
	Element Coercion	N	N/A

Transfer Syntax Selection Policies

This section provides tables that describe the Transfer Syntax preference for different SOP Classes or SOP Class groups when there are multiple Transfer Syntaxes provided by the Association initiator in the **same presentation Context** for Real-World Activity Storage of Core Server AE.

Table 7-8 Transfer Syntax Selection Preference Order - Image SOP Classes for Core Server AE

Preference Order	Transfer Syntax	UID	Comments
1	JPEG Lossless, Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	
2	JPEG Process 14, lossless, Non-Hierarchical	1.2.840.10008.1.2.4.57	
3	JPEG-LS Lossless	1.2.840.10008.1.2.4.80	
4	RLE Lossless	1.2.840.10008.1.2.5	
5	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	
6	JPEG Baseline (Process 2&4)	1.2.840.10008.1.2.4.51	

Preference Order	Transfer Syntax	UID	Comments
7	JPEG-LS Lossy (Near-Lossless)	1.2.840.10008.1.2.4.81	
8	JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	
9	JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	
10	Explicit VR Little-Endian	1.2.840.10008.1.2.1	
11	Implicit VR Little-Endian	1.2.840.10008.1.2	
12	Explicit VR Big-Endian	1.2.840.10008.1.2.2	

Table 7-9 Transfer Syntax Selection Preference Order - Video SOP Classes for Core Server AE

Preference Order	Transfer Syntax	UID	Comments
1	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	When Video SOP class is used to transfer single frame or multi-frame images using JPEG Baseline Transfer Syntax, only XERO Viewer can display the images
2	MPEG2 Main Profile / Main Level	1.2.840.10008.1.2.4.100	
3	MPEG2 Main Profile / High Level	1.2.840.10008.1.2.4.101	Supported by Core Server for Storage only. Display is supported in XERO Viewer
4	MPEG-4 AVC/H.264 High Profile / Level 4.1	1.2.840.10008.1.2.4.102	Supported by Core Server for Storage only. Display is supported in XERO Viewer
5	MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1	1.2.840.10008.1.2.4.103	Supported by Core Server for Storage only. Display is supported in XERO Viewer
6	MPEG-4 AVC/H.264 High Profile / Level 4.2 For 2D Video	1.2.840.10008.1.2.4.104	Supported by Core Server for Storage only. Display not supported
7	MPEG-4 AVC/H.264 High Profile / Level 4.2 3D Video	1.2.840.10008.1.2.4.105	Supported by Core Server for Storage only. Display not supported

Table 7-10 Transfer Syntax Selection Preference Order - Non-Image SOP Classes for Core Server AE

Preference Order	Transfer Syntax	UID	Comments
1	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99	
2	Explicit VR Little-Endian Transfer Syntax	1.2.840.10008.1.2.1	
3	Implicit VR little-Endian Transfer Syntax	1.2.840.10008.1.2	
4	Explicit VR Big-Endian Transfer Syntax	1.2.840.10008.1.2.2	

7.2.1.4.4 Real-World Activity Archive

After that a modality or a PACS acting as a Storage SCU stored the study/series/Instances to the Core Server AE they can request a storage commitment of the instances to Enterprise Imaging.

The Core Server AE accepts Association for the Storage Commitment Push Model SOP class with Transfer Syntaxes Implicit VR Little Endian.

Note that The Core Server AE attempt to send the N-EVENT-REPORT in the same association as the N-ACTION received from the Modality or PACS. If the N-ACTION association closes during the transaction, the Core server AE will initiate a new Storage Commitment Push Model SOP class association with Transfer Syntaxes Implicit VR Little Endian to send the N-EVENT-REPORT to the Modality or PACS.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity Archive are already document in Table 7-7 for the Storage part. For the Storage commitment part, Extended Negotiation is not applicable.

7.2.2 Core Server Print AE Application Entity

7.2.2.1 Sequencing of Real-World Activities for Core Server Print AE

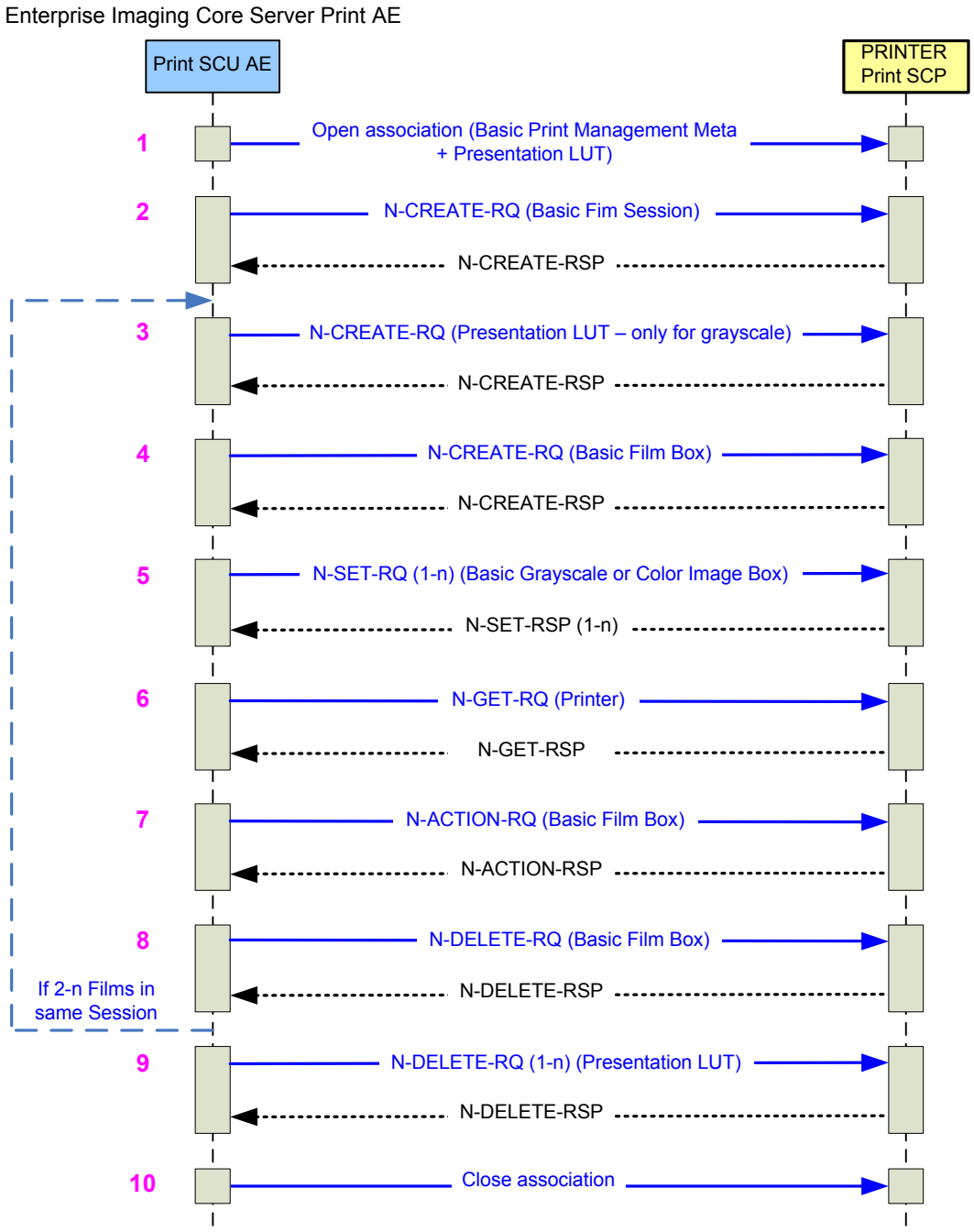

Figure 7-6 Sequencing of Real-World Activities for Core Server Print AE

The user can print DICOM images to a specific hardcopy device from a displayed study in the image area of the Diagnostic / acquisition Desktop.

A priori, a Dialog Box is displayed with print options (Print entire study or tagged images /series, Printer selection, Orientation, Film Size, Film layout, Number of copies, Number of films). This Dialog Box repeats most of the print options as specified in the selected Printer Preset. The user can override these options in the DICOM printing Dialog Box and in addition choose to hide demographics and/or print True size.

Then, when the User click on the Print button, here is the sequence of EI Core Server Print AE transactions as depicted in the figures above.

1 - Enterprise Imaging Core Server Print AE Opens one association to the Print SCP

2 – The Core server sends one N-CREATE-RQ Basic Film Session (BFS) to the Print SCP. The Print SCP will then return an N-CREATE-RSP containing the BFS Instance UID.

3 - By default, Enterprise Imaging is configured to request the application of a Presentation LUT (P-Values) by the Printer. In this case the Core Server print AE sends one N-CREATE-RQ Presentation LUT to the Print SCP. The Print SCP will then return an N-CREATE-RSP containing the Presentation LUT Instance UID

4 – The Core Server Print AE sends one N-CREATE-RQ Basic Film Box (BFB) to the Print SCP with a refence to the BFS and Presentation LUT Instance UIDs received in steps 2 and 3. The Print SCP will then return an N-CREATE-RSP containing 1-n Basic Image Box Instance UID. (Depending on the number of images requested to be on the film via the Film Layout parameter)

5 – The Core Server Print AE sends one N-SET-RQ Basic Grayscale or Color Image Box (depending on the selected printer capabilities). The print SCP then returns an N-SET-RSP. The operation is repeated until all images of the Films are sent.

6 - Before instructing the Printer to print, an N-GET-RQ on Printer SOP Class is issued by the Core Server Print AE to obtain the current printer status information. If the Printer reports a status of FAILURE in the N-GET-RSP, the print-job is switched to a failed state and the Message Status in Queue Management, issues an 'Error' status.

7 - In case the printer returns a status of NORMAL, The Core Server Print AE sends an N-ACTION-RQ on Basic Film Box (referencing the BFB Instance UID created in step 4) to instruct the Printer to print the film. The Print SCP then returns an N-ACTION-RSP success to indicate that it is printing the film.

8 – The Core Server Print AE sends a N-DELETE-RQ on the Basic Film Box to the Print SCP to instruct the printer to delete the film + associated images from its cache when the film is successfully printed.

If the Film Session contains more than 1 film to print, The Core Server AE repeat steps 3 to 8 until the last film of the session is printed.

9 - The Core Server Print AE sends one N-DELETE-RQ on Presentation LUT to the Print SCP for each Presentation LUT Instances created to instruct the printer to delete them from its cache. (There is One Presentation LUT Instance per Film

10 – The Core Server Print AE closes the association with the Print SCP

Notes:

Enterprise Imaging applies a pixel depth rule in order to convert the original image to 8 or 12bit for printing (see Table 5-23). Additionally, images may be converted to or from RGB 8 bit/pixel depending on printer capabilities (See Table 5-28)

The pixel data may optionally include burned in demographics and/or markup in the image area.

The WADO service is used to generate printable DICOM objects.

Multi-frame objects are converted to single frames for printing, one object per frame.

7.2.2.2 Association Parameters of Core Server Print AE

Table 7-11 lists only Association parameters applicable to Core Server AE which are not already mentioned in the General Association Parameters Table 7-1

Table 7-11 Association Parameters for Core Server Print AE

Networking Services	Name	Value
Print as SCU	Implementation Class UID	1.3.51.0.1.3
	Implementation Version Name	DPM1.00

7.2.2.3 Association Initiation

This section details the Association policies of the Application Entity when it is initiating an Association.

7.2.2.3.1 Real-World Activity Printing

The Core Server Print AE proposes only one Transfer syntax: Implicit VR Little Endian.

Depending on the pre-defined printer capabilities (Color or Grayscale), Enterprise Imaging Core Server Print AE proposes:

- Basic Grayscale Print management Meta SOP class

or

- Basic Color Print management Meta SOP class.

In addition, The Core Server always propose the following SOP class in the association:

- Print Job
- Basic Annotation Box
- Presentation LUT

However only Presentation LUT is used if the selected printer is configured for P-Value.

Extended Negotiation

Not applicable for Print service Classes.

7.2.3 Web Server AE Application Entity

7.2.3.1 Sequencing of Real-World Activities for Web Server AE

The XERO User can Search (C-FIND) for studies in external PACS/VNA and retrieve (C-MOVE) the images in the web Server AE web cache to display them.

Alternatively, the retrieval of images can be performed using WADO-URI get request to a Web Origin server.

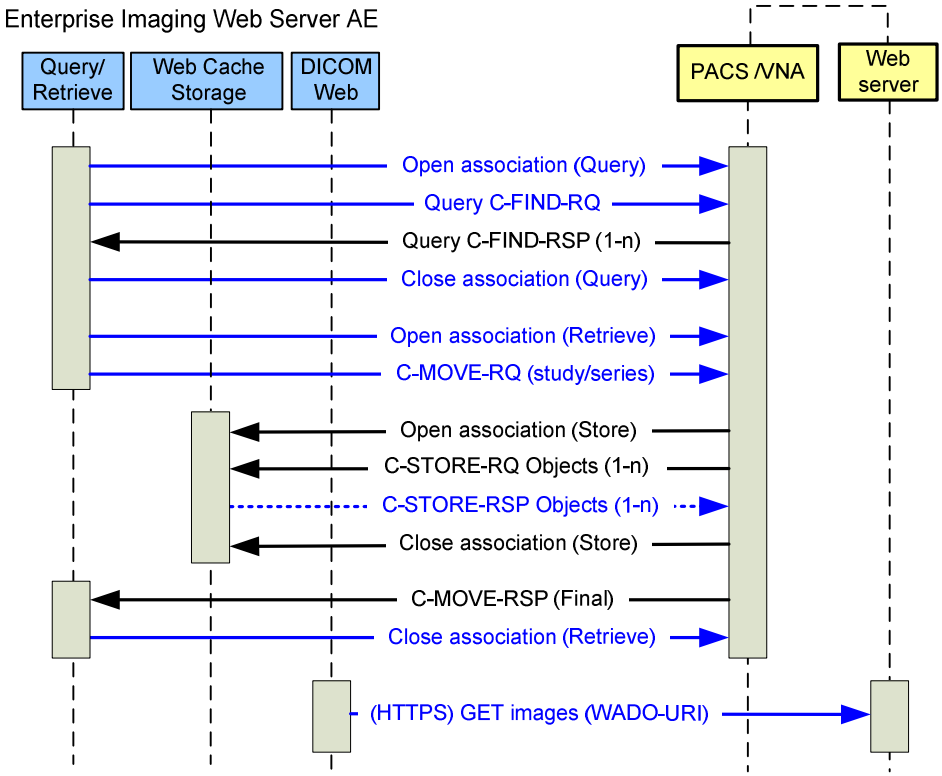

Figure 7-7 Sequencing of Real-World Activities for Web Server AE

7.2.3.2 Association Parameters of Web Server AE

Table **7-12** lists only Association parameters applicable to Web Server AE which are not already mentioned in the General Association Parameters Table 7-1

Table 7-12 Association Parameters for Core Server AE

Networking Services	Name	Value
Query / Retrieve as SCU	Implementation Class UID	1.2.40.0.13.1.1
	Implementation Version Name	dcm4che-2.0
Storage as SCU	Implementation Class UID	1.2.40.0.13.1.3
	Implementation Version Name	dcm4che-8.2.GC.2

7.2.3.3 Association Initiation

This section details the Association policies of the Application Entity when it is initiating an Association.

7.2.3.3.1 Real-World Activity Query/Retrieve

- Enterprise Imaging Web Server AE proposes the Query SOP classes / Transfer Syntaxes supported as SCU in Table 1-6.

  Each Presentation Context contain one Transfer Syntax in the Association Initiation.

- Enterprise Imaging Web Server AE proposes the Retrieve SOP classes / Transfer Syntaxes supported as SCU in Table 1-6.

  Each Presentation Context contain one Transfer Syntax in the Association Initiation.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity Query/Retrieve are described in Table 7-13.

Table 7-13 Extended Negotiation for Query/Retrieve of Web Server AE - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Query			
Applicable to the following Query Retrieve - FIND SOP Classes: Patient Root, Study Root, Patient/Study Only	Relational queries	Y	1
	Date-time matching	N	N/A
	Fuzzy semantic matching of person names	N	N/A
	Timezone query adjustment	N	N/A
	Enhanced Multi-Frame Image Conversion	N	N/A
Retrieve			
Applicable to the Study Root Query Retrieve - MOVE SOP Class.	Relational retrieval	N	N/A
	Enhanced Multi-Frame Image Conversion	N	N/A
	Timezone query adjustment	N	N/A

7.2.3.4 Association Acceptance

This section details the Association policies of the Application Entity when it is the acceptor of an Association.

7.2.3.4.1 Real-World Activity Storage

The Web Server AE accepts Association for the Storage SOP classes / Transfer Syntaxes supported as SCP listed in Table 1-1

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity Storage are described in Table 7-14**Table 7-7**.

Table 7-14 Extended Negotiation for Storage of Core Server AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Requested Value
Storage			

SOP Class	Extended Negotiation	Support	Requested Value
Applicable to all Storage SOP Classes listed under Table 1-1	Level of support	N	N/A
	Level of Digital Signature support	N	N/A
	Element Coercion	N	N/A

Transfer Syntax Selection Policies

See Table 7-8 to Table 7-10 for the Transfer Syntax preference for different SOP Classes or SOP Class groups when there are multiple Transfer Syntaxes provided by the Association initiator in the **same presentation Context** for Real-World Activity Storage of Web Server AE.

7.3 Status Codes

The following sections describe the Status Codes supported by the system for each implemented service as well as the reason for issuing specific Status codes or the associated behavior when receiving it.

7.3.1 General AE Communication and Failure Behavior and Handling

7.3.1.1 Communication Failure Behavior as Association Initiator

Table 7-15 describes behavior of the AE if a communication failure occurs when it initiated an Association.

Table 7-15 DICOM Communication Failure Behavior as Association Initiator

Failure	Failure Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The real-world activity is halted, and an error may be reported to the user.
Association aborted	The command is marked as failed. The real-world activity is halted, and an error may be reported to the user.

7.3.1.2 Communication Failure Handling as Association Acceptor

Table 7-16 describes how the AE responds when it receives an Association request that leads to a failure in communication.

Table 7-16 DICOM Communication Failure Handling as Association Acceptor

Exception	Failure response
Failure during processing of an Association request	A-ABORT message is sent out and the connection is closed
Unrecognized Called AE	AE responds with Association-RJ Reason 7: called-AE-title-not-recognized
Unrecognized Calling AE	AE responds with Association-RJ Reason 3: calling-AE-title-not-recognized
Exceed limit for number of connections supported	AE responds with Association-RJ

7.3.2 DIMSE Services

7.3.2.1 Basic Worklist Management Service

7.3.2.1.1 SCU of the Modality Worklist Information Model Find SOP Class – C-FIND – N/A

N/A

7.3.2.1.2 SCP of the Modality Worklist Information Model FIND SOP Class – C-FIND

Table 7-17 lists the Status Codes that the SCP of the Modality Worklist Information Model Find SOP Class supports for the C-FIND message and defines conditions in which the listed Status Codes are sent.

Table 7-17 Status Codes for C-FIND of the Modality Worklist Information Model SOP Class - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Matching is complete - No final identifier is supplied	0000	Operation performed properly
Failure	SOP Class Not Supported	0122	
	Not Authorized	0124	
	Duplicate Invocation	0210	the Message ID (0000,0110) specified is allocated to another notification or operation
	Unrecognized Operation	0211	the operation is not one of those agreed between the DIMSE-service-users
	Out of Resources - Unable to calculate number of matches	A701	Constraint validation failed. Unconstrained C-FIND not allowed
	Error: Data Set does not match SOP Class	A900	Sent when an SCU attempts to request an Identifier that doesn't match SOP Class attributes.
	Error: Unable to process	C000	Sent when the SCP is Unable to Process the SCU request.
Cancel	Matching terminated due to cancel	FE00	It is terminated due to C-Cancel-RQ from the SCU
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	

7.3.2.2 Modality Performed Procedure Step Service

7.3.2.2.1 SCU of the Modality Performed Procedure Step SOP Class – N-CREATE – N/A

Error! Reference source not found.N/A

7.3.2.2.2 SCU of the Modality Performed Procedure Step SOP Class – N-SET – N/A

N/A

7.3.2.2.3 SCP of the Modality Performed Procedure Step SOP Class – N-CREATE

Table 7-18 lists the Status Codes that the SCP of the Modality Performed Procedure Step SOP Class supports for the N-CREATE message and defines conditions in which the listed Status Codes are sent.

Table 7-18 Status Codes for N-CREATE of the Modality Performed Procedure Step SOP Class - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Success	0000	The SCP has completed the operation successfully
Warning	Attribute List Error	0107	one or more Attribute Values were not read/modified/created because the specified Attribute was not recognized
	Attribute Value Out of Range	0116	the Attribute Value specified was out of range or otherwise inappropriate
Failure	No Such Attribute	0105	the Tag for the specified Attribute was not recognized
	Invalid Attribute Value	0106	If the Performed Procedure Step Status has a value other than IN PROGRESS. EI may return 0110 instead of 0105
	Processing Failure	0110	Sent when an SCU attempts to create a MPPS which SOP Instance UID has already existed, or when Enterprise Imaging failed to create the MPPS record in the system
	Duplicate SOP Instance	0111	the new managed SOP Instance Value supplied by the invoking DIMSE-service-user was already registered for a managed SOP Instance of the specified SOP Class
	Invalid SOP Instance	0117	the SOP Instance UID specified implied a violation of the UID construction rules
	No Such SOP Class	0118	the SOP Class was not recognized
	Missing Attribute	0120	a required Attribute was not supplied. EI may return 0110 instead of 0120
	Missing Attribute Value	0121	One or more Type 1 attributes are either not available or are empty. EI may return 0110 instead of 0121
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	the Message ID (0000,0110) specified is allocated to another notification or operation. EI may return 0111 instead of 0210
	Unrecognized Operation	0211	the operation is not one of those agreed between the DIMSE-service-users
	Mistyped Argument	0212	one of the parameters supplied has not been agreed for use on the Association between the DIMSE-service-users

7.3.2.2.4 SCP of the Modality Performed Procedure Step SOP Class – N-SET

Table 7-19 lists the Status Codes that the SCP of the Modality Performed Procedure Step SOP Class supports for the N-SET message and defines conditions in which the listed Status Codes are sent.

Table 7-19 Status Codes for N-SET of the Modality Performed Procedure Step SOP Class - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Attribute Value Out of Range	0116	the Attribute Value specified was out of range or otherwise inappropriate
	Attribute List Error	0107	one or more Attribute Values were not read/modified/created because the specified Attribute was not recognized
Failure	No Such Attribute	0105	the Tag for the specified Attribute was not recognized
	Invalid Attribute Value	0106	If the Performed Procedure Step Status is neither IN PROGRESS, COMPLETED nor DISCONTINUED
	Processing Failure - Performed Procedure Step Object may no longer be updated	0110	Sent when an SCU attempts to update a performed procedure step which is COMPLETED or DISCONTINUED, or when it attempts to update an attribute that cannot be updated
	No Such Object Instance	0112	the SOP Instance was not recognized
	Invalid SOP Instance	0117	the SOP Instance UID specified implied a violation of the UID construction rules
	No Such SOP Class	0118	the SOP Class was not recognized
	Class-Instance Conflict	0119	the specified SOP Instance is not a member of the specified SOP class
	Missing Attribute Value	0121	One or more Type 1 attributes are either not present or are empty
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	the Message ID (0000,0110) specified is allocated to another notification or operation
	Unrecognized Operation	0211	the operation is not one of those agreed between the DIMSE-service-users
	Mistyped Argument	0212	one of the parameters supplied has not been agreed for use on the Association between the DIMSE-service-users
	Resource Limitation	0213	the operation was not performed due to resource limitation

7.3.2.3 Unified Worklist and Procedure Step Service – N/A

N/A

7.3.2.4 Instance Availability Notification Service

7.3.2.4.1 SCU of the Instance Availability Notification SOP Class – N-CREATE – N/A

N/A

7.3.2.4.2 SCP of the Instance Availability Notification SOP Class – N-CREATE – N/A

Even though, the SOP class is accepted, the notifications are not processed by Enterprise Imaging.

7.3.2.5 Storage Service

7.3.2.5.1 SCU of the Storage SOP Classes – C-STORE

Table 7-20 lists the Status Codes that the SCU of the Storage SOP Class supports for the C-STORE message and defines the application behavior when encountering the listed Status Codes.

Table 7-20 Status Codes C-STORE for the Storage SOP Classes - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	
Warning	Coercion of Data Elements	B000	Transfer is considered as Successful and marked as completed
	Elements Discarded	B006	Transfer is considered as Successful and marked as completed
	Data Set does not match SOP Class	B007	Transfer is considered as Successful and marked as completed
Failure	Processing Failure	0110	If there is a failure for 1 of the objects, EI will continue sending the other objects. However, the whole Study Transfer is considered as failed **If Study transfer is triggered to a DICOM device** by the user: Message in the UI: “The following study could not be exported: <Procedure name> <Study date/time> <Patient name> <Patient Birth Date>”. The Job can be retried manually via admin desktop **If study transfer is triggered to an Archive Device** (automatic). The job will be retried every hour with a maximum of 4 retries
	SOP Class not supported	0112	Transfer is considered as failed (see details in 0110)
	Invalid SOP Instance	0117	Transfer is considered as failed (see details in 0110)
	Duplicate Invocation	0210	Transfer is considered as failed (see details in 0110)
	Unrecognized Operation	0211	Transfer is considered as failed (see details in 0110)
	Mistyped Argument	0212	Transfer is considered as failed (see details in 0110)
	Not authorized	0214	Transfer is considered as failed (see details in 0110)
	Out of Resources	A700-A7FF	Transfer is considered as failed (see details in 0110)
	Data Set does not match SOP Class	A900-A9FF	Transfer is considered as failed (see details in 0110)
	Cannot Understand	C000-CFFF	Transfer is considered as failed (see details in 0110)
-	Other status codes	anything else	Transfer is considered as failed (see details in 0110)

7.3.2.5.2 SCP of the Storage SOP Classes – C-STORE

Table 7-21 lists the Status Codes that the SCP of the Storage SOP Classes supports for the C-STORE message and defines conditions in which the listed Status Codes are sent.

Table 7-21 Status Codes C-STORE of the Storage SOP Classes - SCP

Service Status	Further Meaning	Status Codes	Related Fields	Condition (and Comments on Related fields)
Success	Success	0000		Operation performed properly.
Warning	Coercion of Data Elements	B000		Values of attributes were modified by the SCP to ensure consistency with former received objects belonging to the same Patient/Study/Series entity
	Elements Discarded	B006		
	Data Set does not match SOP Class	B007		
Refused	SOP Class Not Supported	0122		
	Not Authorized	0124		
	Refused: Out of Resources	A700	(0000,0902)	Indicates that there was not enough storage space to store the image. Recovery from this condition is left to the administrative functions.
Failure	Processing Failure	0110		The operation was not successful.
	Duplicate Invocation	0210		the Message ID (0000,0110) specified is allocated to another notification or operation.
	Unrecognized Operation	0211		the operation is not one of those agreed between the DIMSE-service-users.
	Error: Data Set does not match SOP Class	A900	(0000,0901) (0000,0902)	The Data Set does not encode an instance of the SOP Class specified.
	Error: Cannot understand / unable to process	C000	0000,0902)	coercion error (**Study IUID mismatch**) for Series [IUID] The peer study IUID/ Series IUID send in the DICOM object header does not match peer study IUID/ Series IUID already existing in Enterprise Imaging or Coercion Error (**Series IUID mismatch**) for instance [IUID] The peer Series UID / Instance UID send in the DICOM object header does not match peer Series IUID/ Instance UID already existing in Enterprise Imaging.
	Error: subsequent occurrence of rejected instance	C801	(0000,0902)	It is not allowed to re-use an Instance UID which has been previously rejected for another reason than" data retention policy expired".
	Error: referenced SOP instances belong to different Study than Rejection Note	C802	(0000,0902)	In the DICOM object header of the KOS Rejection Note the Study must match the referenced Study of the Image Object to be deleted.

7.3.2.6 Storage Commitment Service

7.3.2.6.1 SCU of the Storage Commitment Push Model SOP Class – N-ACTION

Table 7-22 lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7-22 Status Codes for N-ACTION of the Storage Commitment Push Model SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	
Failure	Processing failure	0110	Storage Commit N-ACTION job will be retried every hour with a maximum of 4 retries before it turns into “failed”. The administrator user can then initiate manual retry / delete of the N-ACTION Job. Note that the entire study / series will be resend as well before the N-ACTION.
-	Other status codes	anything else	Same as 0110

7.3.2.6.2 SCU of the Storage Commitment Push Model SOP Class – N-EVENT-REPORT

Table 7-23 lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-EVENT-REPORT message and defines the application behavior when encountering the listed Status Codes.

Table 7-23 Status Codes for N-EVENT-REPORT for the Storage Commitment Push Model SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	
Failure	Processing failure	0110	Storage Commit N-EVENT-REPORT job will be retried every 2 minutes with a maximum of 5 retries before it turns into “failed”. The administrator user can then initiate manual retry / delete of the N-EVENT-REPORT Job.
-	Other status codes	anything else	Same as 0110

7.3.2.6.3 SCP of the Storage Commitment Push Model SOP Class – N-ACTION

Table 7-24 lists the Status Codes that the SCP of the Storage Commitment Push Model SOP Class supports for the N-ACTION message and defines conditions in which the listed Status Codes are sent.

Table 7-24 Status Codes for N-ACTION for the Storage Commitment Push Model SOP Class - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Success	0000	
Failure	Processing failure	0110	Something went wrong with the processing of the message

7.3.2.6.4 SCP of the Storage Commitment Push Model SOP Class – N-EVENT-REPORT

Table 7-25 lists the Status Codes that the SCP of the Storage Commitment Push Model SOP Class supports for the N-EVENT-REPORT message and defines conditions in which the listed Status Codes are sent.

Table 7-25 Status Codes for N-EVENT-REPORT for Storage Commitment Push Model SOP Class - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Success	0000	Successful notification
Failure	Processing failure	0110	a general failure in processing the operation was encountered
	No such SOP Instance	0112	the SOP Instance was not recognized
	No such event type	0113	the event type specified was not recognized
	No such argument	0114	the event/action information specified was not recognized/supported
	Invalid argument Value	0115	the event/action information value specified was out of range or otherwise inappropriate
	Invalid SOP Instance	0117	the SOP Instance UID specified implied a violation of the UID construction rules
	No such SOP Class	0118	the SOP Class was not recognized
	Class-instance conflict	0119	the specified SOP Instance is not a member of the specified SOP class
	Duplicate invocation	0210	the Message ID (0000,0110) specified is allocated to another notification or operation
	Unrecognized operation	0211	the operation is not one of those agreed between the DIMSE-service-users
	Mistyped argument	0212	one of the parameters supplied has not been agreed for use on the Association between the DIMSE-service-users

7.3.2.7 Query/Retrieve Service

7.3.2.7.1 SCU of the Query/Retrieve FIND SOP Classes – C-FIND

Table 7-26 lists the Status Codes that the SCU of any of the Query/Retrieve FIND SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7-26 Status Codes C-FIND for Query/Retrieve FIND SOP Classes - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete - No final identifier is supplied	0000	Matching studies provided in the pending responses are listed in the UI
Failure	Refused: Out of Resources	A700	No error is displayed in the UI. The result screen remains empty if no pending responses containing matches were received.
	Error: Data Set does not match SOP Class	A900	No error is displayed in the UI. The result screen remains empty if no pending responses containing matches were received.

Service Status	Further Meaning	Status Code	Behavior
	Error: Unable to process	C000-CFFF	No error is displayed in the UI. The result screen remains empty if no pending responses containing matches were received.
Cancel	Matching terminated due to cancel	FE00	Matching studies returned in the pending response before the Cancel response are listed in the UI.
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Matching studies are listed in the UI once the last C-FIND-RSP is received
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	Matching studies are listed in the UI once the last C-FIND-RSP is received
-	Other status codes	anything else	No error is displayed in the UI. The result screen remains empty if no pending responses containing matches were received.

7.3.2.7.2 SCU of the Query/Retrieve MOVE SOP Classes – C-MOVE

Table 7-27 lists the Status Codes that the SCU of any of the Query/Retrieve MOVE SOP Class supports for the C-MOVE message and defines the application behavior when encountering the listed Status Codes.

Table 7-27 Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes - SCU

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Job marked as completed
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	If the C-MOVE was initiated automatically via prefetching rules, the C-MOVE job will fail and be retried 5 times. If the C-MOVE was initiated by the user (Diagnostic Desktop or XERO) for viewing only (Retrieve in Guest / Web cache). There is no retry. The user needs to re-initiate the request.
Failed	Out of Resources - Unable to calculate number of matches	A701		Same as B000
	Out of Resources - Unable to perform sub-operations	A702		Same as B000
	Move Destination unknown	A801		Same as B000
	Data Set does not match SOP Class	A900		Same as B000
	Unable to process	Cxxx		Same as B000
Cancel	Sub-operations terminated due to Cancel Indication	FE00		Same as B000
Pending	Sub-operations are continuing	FF00		Job continues.

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
-	Other status codes	anything else	-	Same as B000

7.3.2.7.3 SCP of the Query/Retrieve FIND SOP Classes – C-FIND

Table 7-28 lists the Status Codes that the SCP of any of the Query/Retrieve FIND SOP Classes supports for the C-FIND message and defines conditions in which the listed Status Codes are sent.

Table 7-28 Status Codes C-FIND for Query/Retrieve FIND SOP Classes - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Matching is complete - No final identifier is supplied	0000	Operation performed properly
Failure	SOP Class Not Supported	0122	
	Not Authorized	0124	
	Duplicate Invocation	0210	the Message ID (0000,0110) specified is allocated to another notification or operation
	Unrecognized Operation	0211	the operation is not one of those agreed between the DIMSE-service-users
	Out of Resources - Unable to calculate number of matches	A701	Constraint validation failed. Unconstrained C-FIND not allowed
	Error: Data Set does not match SOP Class	A900	The specified identifier contains a request that does not match the specified SOP Class.
	Error: Unable to process	C000	For some reason (such as the database being off-line) this request cannot be processed at this time
Cancel	Matching terminated due to cancel	FE00	EI may abort the association instead of sending status FE00 in case it receives a C-CANCEL-RQ from the SCU
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Study or series or Instance matching the query criteria

7.3.2.7.4 SCP of the Query/Retrieve MOVE SOP Classes – C-MOVE

Table **7-29** lists the Status Codes that the SCP of any of the Query/Retrieve MOVE SOP Classes supports for the C-MOVE message and defines conditions in which the listed Status Codes are sent.

Table 7-29 Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes - SCP

Service Status	Further Meaning	Status Codes	Related Fields sent in the response	Condition	Action on the Store due the condition.
Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	All requested objects were transferred. Number of objects recorded in tag (0000,1021)	Store was successful

Service Status	Further Meaning	Status Codes	Related Fields sent in the response	Condition	Action on the Store due the condition.
			None	No objects were transferred because the study or series or Instance UIDs requested in the C-MOVE-RQ is unknown	No store
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	One of the DICOM object cannot be Stored. Number of failure are recorded in tag (0000,1022) and the warning is recording in tag (0000,1023)	
Failed	SOP Class Not Supported	0122	None		No Store
	Not Authorized	0124			No Store
	Duplicate Invocation	0210		the Message ID (0000,0110) specified is allocated to another notification or operation	No Store
	Unrecognized Operation	0211	None	the operation is not one of those agreed between the DIMSE-service-users	No Store
	Out Of Resources	A700			No Store
	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)		No Store
	Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Unable to perform storage of images to move destination	
	Move Destination unknown	A801	(0000,0902)	Retrieve AET unknown	Store not initiated
	Data Set does not match SOP Class	A900	(0000,0901) (0000,0902)	The specified identifier contains a request that does not match the specified SOP Class	No Store
	Unable to process	C000	(0000,0901) (0000,0902)	For some reason (such as the database being off-line) this request cannot be processed at this time	No Store
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	DICOM objects are still to be sent	Store initiated

7.3.2.8 Print Management Service

7.3.2.8.1 SCU of the Basic Film Session SOP Class

7.3.2.8.1.1 SCU of the Basic Film Session SOP Class – N-CREATE

Table 7-30 lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-30 Status Codes for N-CREATE of the Basic Film Session SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Print job continues
Warning	Attribute List Error	0107	Print job continues. Film Session creation considered as successful.
	Attribute Value Out of Range	0116	Print job continues. Film Session creation considered as successful.
	Memory allocation not supported	B600	Print job continues. Film Session creation considered as successful.
Failure	No Such Attribute	0105	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Invalid Attribute Value	0106	Same as 0105
	Processing Failure	0110	Same as 0105
	Duplicate SOP Instance	0111	Same as 0105
	Invalid SOP Instance	0117	Same as 0105
	No Such SOP Class	0118	Same as 0105
	Missing Attribute	0120	Same as 0105
	Missing Attribute Value	0121	Same as 0105
	Refused: Not Authorized	0124	Same as 0105
	Duplicate Invocation	0210	Same as 0105
	Unrecognized Operation	0211	Same as 0105
	Mistyped Argument	0212	Same as 0105
	Resource Limitation	0213	Same as 0105
-	Other status codes	anything else	Same as 0105

7.3.2.8.1.2 SCU of the Basic Film Session SOP Class – N-SET – N/A

N/A

7.3.2.8.1.3 SCU of the Basic Film Session SOP Class – N-DELETE – N/A

N/A

7.3.2.8.1.4 SCU of the Basic Film Session SOP Class – N-ACTION – N/A

N/A

7.3.2.8.2 SCU of the Basic Film Box SOP Class

7.3.2.8.2.1 SCU of the Basic Film Box SOP Class – N-CREATE

Table 7-31 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-31 Status Codes for N-CREATE of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Print job continues
Warning	Attribute List Error	0107	Print job continues. Film Box creation considered as successful.
	Attribute Value Out of Range	0116	Print job continues. Film Box creation considered as successful.
	Requested Min Density or Max Density outside of printer's operating range	B605	Print job continues. Film Box creation considered as successful.
Failure	No Such Attribute	0105	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Invalid Attribute Value	0106	Same as 0105
	Processing Failure	0110	Same as 0105
-	Other status codes	anything else	Same as 0105

7.3.2.8.2.2 SCU of the Basic Film Box SOP Class – N-SET – N/A

N/A

7.3.2.8.2.3 SCU of the Basic Film Box SOP Class – N-DELETE

Table 7-32 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7-32 Status Codes for N-DELETE of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The print job continues
Failure	Processing Failure	0110	The print job continues

Service Status	Further Meaning	Status Code	Behavior
	Invalid SOP Instance	0117	The print job continues
	No Such SOP Class	0118	The print job continues
	Class Instance Conflict	0119	The print job continues
	Refused: Not Authorized	0124	The print job continues
	Duplicate Invocation	0210	The print job continues
	Unrecognized Operation	0211	The print job continues
	Mistyped Argument	0212	The print job continues
	Resource Limitation	0213	The print job continues
-	Other status codes	anything else	The print job continues

7.3.2.8.2.4 SCU of the Basic Film Box SOP Class – N-ACTION

Table 7-33 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7-33 Status Codes for N-ACTION of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Print job continues
Warning	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B603	The Print job continues
	Image size is larger than Image Box size. The image has been demagnified.	B604	The Print job continues
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	Same as B609
Failure	Processing failure	0110	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Unable to create Print Job SOP Instance; print queue is full.	C602	Same as 0110
	Image size is larger than Image Box size.	C603	Same as 0110
	Combined Print Image Size is larger than Image Box size.	C613	Same as 0110

Service Status	Further Meaning	Status Code	Behavior
-	Other status codes	anything else	Same as 0110

7.3.2.8.3 SCU of the Basic Grayscale Image Box SOP Class - N-SET

Table 7-34 lists the Status Codes that the SCU of the Basic Grayscale Image Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7-34 Status Codes for N-SET of the Grayscale Image Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Print job continues
Warning	Image size is larger than Image Box size. The image has been demagnified.	B604	The Print Job continues
	Requested Min Density or Max Density outside of printer's operating range.	B605	The Print Job continues
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	Same as B609
Failure	Image size is larger than Image Box size.	C603	The Print job is aborted. EI sends an A-ABORT-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	Insufficient memory in printer to store the image.	C605	Same as C603
	Combined Print Image Size is larger than Image Box size.	C613	Same as C603
-	Other status codes	anything else	Same as C603

7.3.2.8.4 SCU of the Basic Color Image Box SOP Class – N-SET

Application behavior is the same as for the N-SET of the Basic Grayscale Image Box listed in Table 7-34

7.3.2.8.5 SCU of the Printer SOP Class

7.3.2.8.5.1 SCU of the Printer SOP Class – N-EVENT-REPORT – N/A

N/A

7.3.2.8.5.2 SCU of the Printer SOP Class – N-GET

Table 7-35 lists the Status Codes that the SCU of the Printer SOP Class supports for the N-GET message and defines the application behavior when encountering the listed Status Codes.

Table 7-35 Status Codes for N-GET of the Printer SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Print Jobs continues provided that the Printer status (2110,0010) value in the N-GET-RSP is NORMAL or WARNING. If value is FAILURE the Print job is aborted. EI sends an A-RELEASE-RQ to release the association. The Print job is automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
Warning	Attribute List Error	0107	Same as 0000
Failure	Processing Failure	0110	If there is no dataset in the C-GET-RSP because of the failure – dataset type (0000,0800) = 0x0101, the print job hangs after the N-ACTION. Association will then timeout and the print job will be automatically retried 4 times every 60 seconds and then it goes to fail. The Admin user can retry or delete manually the failed jobs in the Queue management dashboard.
	No Such SOP Instance	0112	Same as 0110
	Invalid SOP Instance	0117	Same as 0110
-	Other status codes	anything else	Same a 0110

7.3.2.8.6 SCU of the Basic Annotation Box SOP Class – N-SET – N/A

N/A

7.3.2.8.7 SCU of the Print Job SOP Class – N/A

N/A

7.3.2.8.8 SCU of the Presentation LUT SOP Class

7.3.2.8.8.1 SCU of the Presentation LUT SOP Class – N-CREATE

Table 7-36 lists the Status Codes that the SCU of the Presentation LUT SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-36 Status Codes N-CREATE of the Presentation LUTSOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Print job continues
Warning	Attribute List Error	0107	The Print job continues
	Attribute Value Out of Range	0116	The Print job continues

Service Status	Further Meaning	Status Code	Behavior
	Requested Min Density or Max Density outside of printer's operating range	B605	The Print job continues
Failure	No Such Attribute	0105	The Print Job continues but if there are more than 1 film to print in the Film Session, the N-CREATE presentation LUT will not be sent for the next films in the Film Session. At the end the print is considered as completed
	Invalid Attribute Value	0106	Same as 0105
	Processing Failure	0110	Same as 0105
-	Other status codes	anything else	Same as 0105

7.3.2.8.8.2 SCU of the Presentation LUT SOP Class – N-DELETE

Table **7-37** lists the Status Codes that the SCU of the Presentation LUT SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7-37 Status Codes for N-DELETE of the Presentation LUT SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The print job continues
Failure	Processing Failure	0110	EI sends one additional N-DELETE of the presentation LUT and then it releases the association. N-DELETE of the presentation LUT being the last transaction, the print job is considered as completed.
-	Other status codes	anything else	Same as 0110

7.3.2.8.9 SCU of the Printer Configuration Retrieval SOP Class - N-GET – N/A

N/A

7.3.2.8.10 SCP of the Basic Film Session SOP Class – N/A

N/A

7.3.2.8.11 SCP of the Basic Film Box SOP Class – N/A

N/A

7.3.2.8.12 SCP of the Basic Grayscale Image Box SOP Class - N-SET – N/A

N/A

7.3.2.8.13 SCP of the Basic Color Image Box SOP Class - N-SET – N/A

N/A

7.3.2.8.14 SCP of the Printer SOP Class – N/A

N/A

7.3.2.8.15 SCP the Basic Annotation Box SOP Class - N-SET – N/A

N/A

7.3.2.8.16 SCP of the Print Job SOP Class – N/A

N/A

7.3.2.8.17 SCP of the Presentation LUT SOP Class – N/A

N/A

7.3.2.8.18 SCP of the Printer Configuration Retrieval SOP Class - N-GET – N/A

N/A

7.3.3 DICOM Web Services

7.3.3.1 General Status Codes – WIP

7.3.3.1.1 Common Transaction as Origin Server – WIP

WIP

7.3.3.1.2 Common Transaction as User Agent – WIP

WIP

7.3.3.2 URI Web Service

7.3.3.2.1 URI Web Service as Origin Server

Table 7-38 lists the Status Codes that **EI Core Server** as origin server supports for the URI Web Service and the conditions in which the listed Status Codes are sent:

Table 7-38 Status Codes of Origin Server for URI Service

Status	Code	Condition
Success	200 (OK)	Delivery of the requested instance is successful
Failure	404 (Not Found)	The requested instance is not available. ERR_INSTANCE_UNAVAILABLE is returned in case contentType is application/dicom Or No content found for this request. /wado/ is returned in case content type is other than application/dicom
	500	The objectUID is not provided in the request.

Status	Code	Condition
		(ERR_INTERNAL_ERROR) An internal error has occurred: javax.ejb.EJBException: java.lang.IllegalArgumentException: Empty parameters passed in would result in unbounded query

7.3.3.2.2 URI Web Service as User Agent

Table 7-39 lists the Status Codes that EI Web Server as user agent supports for the URI Web Service and defines the application behavior when encountering the listed Status Codes.

Table 7-39 Status Codes of User Agent for URI Service

Status	Code	Behavior
Success	200 (OK)	Requested object is received,
Failure	400 (Bad)	Error code is displayed in the XERO viewport.
	404 (Not Found)	Error code is displayed in the XERO viewport. The user needs to re-initiate the request
	410 (Gone)	Error code is displayed in the XERO viewport
-	Other status codes	Error code is displayed in the XERO viewport

7.3.3.3 Studies Web Service

7.3.3.3.1 Retrieve Transaction as Origin Server - WIP

WIP

7.3.3.3.2 Retrieve Transaction as User Agent – N/A

WIP

7.3.3.3.3 Store Transaction as Origin Server - WIP

WIP

7.3.3.3.4 Store Transaction as User Agent – N/A

N/A

7.3.3.3.5 Search Transaction as Origin Server – WIP

WIP

7.3.3.3.6 Search Transaction as User Agent – N/A

N/A

7.3.3.4 Worklist Web Service – N/A

N/A

7.3.3.5 Non-Patient Instance Web Service – N/A

N/A

8 SECURITY - TBC

Information from Enterprise Imaging 8.3.X DCS revision 5 (based on template revision 16).

Security Profiles

Enterprise Imaging supports secure DICOM communication in conformance with the Basic TLS Secure Transport Connection Profile. At default configuration, the TLS option is deactivated. Basic TLS security profile is only available for inbound traffic to EI.

Association Level Security

Enterprise Imaging provides association level security by restricting acceptance to association requests only from DICOM AEs configured in Enterprise Imaging.

Association requests from unknown DICOM AEs will be rejected.

Application Level Security

Enterprise Imaging Administration Tools require a valid username and password pair to login.

Core Server and Web Server User Interfaces require user authentication in order to access user interface functionality.

Activities are logged according to the IHE Audit Trail and Node Authentication (ATNA) Profile.

ANNEXES

A Information Object Definitions (IODs)

This section describes all the SOP Instances natively created by Enterprise Imaging, (i.e., all SOP Classes that are marked in the "Created" column in Table 1-1). Details on Attribute coercion are defined in Section 5.2.5.2

Core Server creates Grayscale Softcopy Presentation State as PR modality, Encapsulated PDF as SR modality, Segmentation as SEG modality and Key Object Selection Document as KO modality.

Web Server creates RAW Data as DOC modality, General Audio Waveform as AU modality, Encapsulated PDF as SR modality, VL Photographic image and Video photographic image as XC modality.

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.
- QUERY: The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.
- SRC_INSTANCE: The Value is copied from previously created/received SOP Instances.

The "Presence" columns reflect the usage of the Module, Functional Group Macro, Attributes, or Value in Enterprise Imaging Implementation and is not necessarily the same as defined in the DICOM Standard. For the "Presence" column the following Values can be used:

- ALWAYS: the module, functional group macro, Attributes or Value is always present.
- CONDITIONAL: the presence of the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Conditions" column.
- SRC_COPY: The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a Value (zero length).

A.1 Information Shared Across Multiple IODs

A.1.1 Common Modules

All SOP Instances generated by the system use the common modules listed in Table A-1 to

Table A-12 or a subset of them, as defined in the IOD specific subsections below.

Table A-1 Patient Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient's Name	(0010,0010)	SRC_INSTANCE	ALWAYS	ALWAYS			
Patient ID	(0010,0020)	SRC_INSTANCE	ALWAYS	ALWAYS			
Issuer of Patient ID	(0010,0021)	SRC_INSTANCE	ALWAYS; SRC_COPY	SRC_COPY		Transfer; Export to media	
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	FIXED	ALWAYS	ALWAYS			
>Universal Entity ID	(0040,0032)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Universal Entity ID Type	(0040,0033)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Identifier Type Code	(0040,0035)	FIXED	ALWAYS	ALWAYS	PAT_CODE		
Patient's Birth Date	(0010,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
Patient's Sex	(0010,0040)	SRC_INSTANCE	ALWAYS	SRC_COPY			
Other Patient IDs	(0010,1000)	SRC_INSTANCE	SRC_COPY	SRC_COPY			Retired
Other Patient IDs Sequence	(0010,1002)	FIXED	ALWAYS	ALWAYS			
> Patient ID	(0010,0020)	SRC_INSTANCE	ALWAYS	ALWAYS			
> Issuer of Patient ID	(0010,0021)	SRC_INSTANCE	SRC_COPY; ALWAYS	SRC_COPY		Transfer; Export to media	
>Type of Patient ID	(0010,0022)	FIXED	ALWAYS	ALWAYS	TEXT		
> Issuer of Patient ID Qualifiers Sequence	(0010,0024)	FIXED	ALWAYS	ALWAYS			
>>Universal Entity ID	(0040,0032)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Universal Entity ID Type	(0040,0033)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Identifier Type Code	(0040,0035)	FIXED	ALWAYS	ALWAYS	PAT_CODE		
Patient Comments	(0010,4000)	SRC_INSTANCE	SRC_COPY	SRC_COPY			

Table A-2 General Study Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Study Instance UID	(0020,000D)	SRC_INSTANCE	ALWAYS	ALWAYS			
Study Date	(0008,0020)	SRC_INSTANCE	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Study Time	(0008,0030)	SRC_INSTANCE	ALWAYS	ALWAYS			
Referring Physician's Name	(0008,0090)	SRC_INSTANCE	SRC_COPY	SRC_COPY		Core Server	
		GENERATED	ALWAYS	ALWAYS	<username>	XERO Capture	
Study ID	(0020,0010)	SRC_INSTANCE	ALWAYS	SRC_COPY		Core Server	
		GENERATED		ALWAYS		XERO Capture	
Accession Number	(0008,0050)	SRC_INSTANCE	ALWAYS	SRC_COPY		Core Server	
		GENERATED		ALWAYS		XERO Capture	
Study Description	(0008,1030)	SRC_INSTANCE	ALWAYS	SRC_COPY		Core Server	
		CONFIGURATION		ALWAYS		XERO Capture	
Requesting Service Code Sequence	(0032,1034)	ALWAYS	CONDITIONAL	ALWAYS	Sequence	Segmentation XERO Capture	
>Coding Scheme Version	(0008,0103)	FIXED	ALWAYS	ALWAYS	1		
Procedure Code Sequence	(0008,1032)	SRC_INSTANCE	SRC_COPY	SRC_COPY	Sequence		
>Code Value	(0008,0100)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Coding Scheme Designator	(0008,0102)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Coding Scheme Version	(0008,0103)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Code Meaning	(0008,0104)	SRC_INSTANCE	ALWAYS	ALWAYS		Core Server Video Photo VL Photo	

Table A-3 Patient Study Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient's Age	(0010,1010)	SRC_INSTANCE	SRC_COPY	SRC_COPY		Segmentation GSPS XERO Capture	
Patient's Size	(0010,1020)	SRC_INSTANCE	SRC_COPY	SRC_COPY		Segmentation GSPS XERO Capture	
Patient's Weight	(0010,1030)	SRC_INSTANCE	SRC_COPY	SRC_COPY		Segmentation GSPS XERO Capture	

Table A-4 General Series Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	See A.1.4 Or Specific series modules		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS			
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS		Segmentation GSPS XERO Capture	
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS		Segmentation GSPS XERO Capture	
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS		Segmentation GSPS XERO Capture	
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS	Segmentation mask <name of the mask>	Segmentation	
		USER			<Free text>	GSPS Raw Data Video Photo VL Photo	
Referenced Performed Procedure Step Sequence	(0008,1111)	SRC_INSTANCE	SRC_COPY	SRC_COPY	Sequence	GSPS	
>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	SRC_COPY	SRC_COPY		GSPS	
>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	SRC_COPY	SRC_COPY		GSPS	
Body Part Examined	(0018,0015)	SRC_INSTANCE	SRC_COPY	SRC_COPY		Core Server	
Request Attributes Sequence	(0040,0275)	SRC_INSTANCE	ALWAYS	SRC_COPY	Sequence	Segmentation GSPS XERO Capture	
>Requested Procedure ID	(0040,1001)	SRC_INSTANCE	ALWAYS	SRC_COPY		Segmentation GSPS XERO Capture	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Requested Procedure description	(0032,1060)	SRC_INSTANCE	ALWAYS	SRC_COPY		Segmentation GSPS XERO Capture	
>Requested Procedure Code Sequence	(0032,1064)	SRC_INSTANCE	ALWAYS	SRC_COPY	Sequence	Segmentation GSPS XERO Capture	
>>Code Value	(0008,0100)	SRC_INSTANCE	ALWAYS	SRC_COPY		Segmentation GSPS XERO Capture	
>>Coding Scheme Designator	(0008,0102)	SRC_INSTANCE	ALWAYS	SRC_COPY		Segmentation GSPS XERO Capture	
>>Coding Scheme Version	(0008,0103)	SRC_INSTANCE	ALWAYS	SRC_COPY		Segmentation GSPS XERO Capture	

Table A-5 Frame of Reference Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame of Reference UID	(0020,0052)	SRC_INSTANCE	ALWAYS	ALWAYS		Segmentation	
Position Reference Indicator	(0020,1040)	FIXED	ALWAYS	EMPTY		Segmentation	

Table A-6 General Equipment Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	CONDITIONAL	AGFA	Encapsulated PDF Core Server Segmentation GSPS XERO Capture	
Institution Name	(0008,0080)	FIXED	ALWAYS	EMPTY	Empty even if populated in images	Segmentation GSPS KOSD	
				ALWAYS	Some Institution	XERO Capture	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Institution Address	(0008,0081)	FIXED	ALWAYS	EMPTY		Segmentation GSPS KOSD	
				ALWAYS	Institution Address	XERO capture	
Institutional Department Name	(0008,1040)	FIXED	ALWAYS	EMPTY		Segmentation GSPS KOSD	
		CONFIGURATION		ALWAYS	<performing department>	XERO Capture	
Manufacturer Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	IMPAX AGILITY GENRAD	Segmentation GSPS KOSD	
					XERO	XERO Capture	
Station Name	(0008,1010)	FIXED	ALWAYS	EMPTY		Segmentation GSPS KOSD	
				ALWAYS	XERO	XERO Capture	
Device Serial Number	(0018,1000)	FIXED	ALWAYS	EMPTY		Segmentation GSPS KOSD	
Software Versions	(0018,1020)	FIXED; GENERATED	ALWAYS	ALWAYS	V1	Segmentation	
					<EI build number>	GSPS KOSD	
					8.1.4	XERO Capture	

Table A-7 General Acquisition Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Date	(0008,0022)	SRC_INSTANCE	ALWAYS	ALWAYS		Encapsulated PDF Raw Data Video Photographic VL Photographic	XERO capture
Lossy Image Compression	(0008,0032)	SRC_INSTANCE	ALWAYS	ALWAYS		Encapsulated PDF Raw Data	XERO Capture

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
						Video Photographic VL Photographic	

Table A-8 General Image Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	0	segmentation	Also in seg img mod
					1	Video Photo VL Photo	
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS		segmentation	
Content time	(0008,0033)	GENERATED	ALWAYS	ALWAYS		segmentation	
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	PRIMARY\ DERIVED	Segmentation	Also in seg img mod
					ORIGINAL\ PRIMARY	Video Photo VL Photo	

Table A-9 Image Pixel Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Samples Per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	1	Segmentation	Also in seg img mod
					3	VL Photo	
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	MONOCHROME2	Segmentation	Also in seg img mod
					YBR_FULL_422	VL Photo JPG	
					RGB	VL Photo PNG	
Rows	(0028,0010)	GENERATED	ALWAYS	ALWAYS		Segmentation	
		SRC_INSTANCE				Video Photo VL Photo	
Columns	(0028,0011)	GENERATED	ALWAYS	ALWAYS		Segmentation	
		SRC_INSTANCE				Video Photo VL Photo	
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	1	Segmentation Type (0062,0001) is BINARY	Also in seg img mod
					8	VL Photo	
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	1	Segmentation	Also in seg img mod

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					8	VL Photo	
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	0	Segmentation	Also in seg img mod
					7	VL Photo	
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0	Segmentation VL Photo	Also in seg img mod
Pixel Data	(7FE0,0010)	GENERATED	ALWAYS	ALWAYS		Segmentation Video Photo VL Photo	

Table A-10 Multi-Frame Functional Groups Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shared Functional Groups Sequence	(5200,9229)	GENERATED	ALWAYS	ALWAYS			
>Pixel Measure Functional group Macro	See Table A-13						
>Plane orientation(patient) functional group	See Table A-16						
>Segmentation Functional Group Macro	See Table A-38						
Per-frame Functional Groups Sequence	(5200,9230)	GENERATED	ALWAYS	ALWAYS			
>Frame Content Functional group Macro	See Table A-14						
>Plane Position (Patient) functional group Macro	See Table A-15						
Number of Frames	(0028,0008)	GENERATED	ALWAYS	ALWAYS			

Table A-11 Multi-Frame Dimension Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Dimension Organization Sequence	(0020,9221)		ALWAYS	ALWAYS			
Dimension Index Sequence	(0020,9222)		CONDITIONAL			Required if Dimension Organization Type (0020,9311)	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
						is absent or not TILED_FULL. May be present otherwise	

Table A-12 SOP Common Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	GENERATED	ALWAYS	ALWAYS			Value matches SOP Class of generated object
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			
Specific Character Set	(0008,0005)	CONFIGURATION	ALWAYS	ALWAYS	See Section 1.7		
Instance Creation Date	(0008,0012)	GENERATED	ALWAYS	ALWAYS			
Instance Creation Time	(0008,0013)	GENERATED	ALWAYS	ALWAYS			
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS		Segmentation GSPS KOSD XERO Capture	

A.1.2 Common Functional Group Macros

The tables below list the Common Functional Group Macros that can either be used as part of the Shared Functional Groups Sequence (5200,9229) or as part of the Per-frame Functional Groups Sequence (5200,9230) of enhanced image IODs.

Table A-13 Pixel Measures Functional Group Macro

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Pixel Measures Sequence	(0028,9110)	GENERATED	ALWAYS	ALWAYS			
>Pixel Spacing	(0028,0030)	GENERATED	ALWAYS	ALWAYS			
>Slice Thickness	(0018,0050)	GENERATED	ALWAYS	ALWAYS			

Table A-14 Frame Content Functional Group Macro

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame Content Sequence	(0020,9111)	FIXED	ALWAYS	EMPTY			Sequence always empty

Table A-15 Plane Position (Patient) Functional Group Macro

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Plane Position Sequence	(0020,9113)	GENERATED	ALWAYS	ALWAYS			
>Image Position (Patient)	(0020,0032)	GENERATED	ALWAYS	ALWAYS			

Table A-16 Plane Orientation (Patient) Functional Group Macro

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Plane Orientation Sequence	(0020,9116)	GENERATED	ALWAYS	ALWAYS			
>Image Orientation (Patient)	(0020,0037)	GENERATED	ALWAYS	ALWAYS			

A.1.3 Common Private Modules

Common Private modules / tags might be presents in multiple IODs generated by the system. They are for internal use only and documented in internal AGFA HealthCare documentation.

A.1.4 Coded Values

Table A-17 lists Coded Values referenced from the "Value" column of the tables above.

Table A-17 Values and Code Sets shared across IODs

Attribute Name	Tag	Value/Code	Condition	Comments
Modality	(0008,0060)	PR	Grayscale Softcopy Presentation State IOD	Core Server
		SEG	Segmentation IOD	Core Server
		KO	Key Object Selection IOD	Core Server
		SR	Encapsulated PDF IOD	Web Server (XERO Capture)
		DOC		Core Server
			Raw Data IOD	Web Server (XERO Capture)
		AU	General Audio Waveform IOD	Web Server (XERO Capture)
		XC	Video Photographic IOD	Web Server (XERO Capture)

Attribute Name	Tag	Value/Code	Condition	Comments
			VL Photographic IOD	Web Server (XERO Capture)

A.2 Grayscale Softcopy Presentation State IOD

When a user saves as GSPS images manipulation performed in Diagnostic or Acquisition Desktop, a “standard GSPS” is created and an AGFA GSPS is created as well for internal Enterprise Imaging use only. Only the Standard GSPS is to be used by external systems.

To recognize the AGFA GSPS, look for the private tag (0011,1111) having the value AGSPS.

Table A-18 defines the structure of Grayscale Softcopy Presentation State (GSPS) IOD.

Table A-18 Grayscale Softcopy Presentation State IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
	Presentation Series	ALWAYS		Table A-19
Equipment	General Equipment	ALWAYS		Table A-6
Presentation State	Presentation State Identification	ALWAYS		Table A-20
	Presentation State Relationship	ALWAYS		Table **A-21**
	Presentation State Shutter	ALWAYS		Table **A-22**
	Display Shutter	CONDITIONAL	Rectangular outside Shutter (collimation) to be applied to referenced image(s)	Table **A-23**
	Bitmap Display Shutter	CONDITIONAL	Ellipse Shutter or Rectangular Shutter inside (filled in) to be applied to referenced image(s)	Table A-24

IE	Module Name	Presence (Module)	Condition	Reference
	Overlay Plane	CONDITIONAL	Overlay is to be applied to referenced image(s) or the Bitmap Display Shutter Module is present	Table **A-25**
	Displayed Area	ALWAYS		Table **A-26**
	Graphic Annotation	CONDITIONAL	Graphic / Annotations are to be applied to referenced image(s)	Table A-27
	Spatial Transformation	ALWAYS		Table A-28
	Graphic Layer	CONDITIONAL	Graphic Annotations or Overlays or Curves are to be applied to referenced image(s)	Table A-29
	Modality LUT	CONDITIONAL	Modality LUT is to be applied to referenced image(s)	Table A-30
	Softcopy VOI LUT	ALWAYS		Table A-31
	Softcopy Presentation LUT	ALWAYS		Table A-32
	SOP Common Module	ALWAYS		Table A-12

A.2.1 Grayscale Softcopy Presentation State IOD Specific Modules

The following tables list Modules and Attributes specific for GSPS IOD:

Table A-19 Presentation Series Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	PR		

Table A-20 Presentation State Identification Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Presentation Creation Date	(0070,0082)	GENERATED	ALWAYS	ALWAYS			
Presentation Creation Time	(0070,0083)	GENERATED	ALWAYS	ALWAYS			
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS			
Content Label	(0070,0080)	FIXED	ALWAYS	ALWAYS	DIAGUSER_DEFINED	Diagnostic user	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					CLINUSER_DEFINED	Clinician user	
					<xyz>FOR_PRINTING	DICOM print	GSPS Auto generated for DICOM print. Only for internal use
Content Description	(0070,0081)	USER; FIXED	ALWAYS	ALWAYS	<Free text>		Same as Series Description
					Presentation state for printing	DICOM print	
Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS			
>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	DIAGNOSTIC	Diagnostic user	
					CLINICIAN	Clinician user	
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	AGFAHC		
>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Diagnostic Presentation	Diagnostic User	
					Clinician Generated Presentation	Clinician user	
Content Creator's Name	(0070,0084)	CONFIGURATION	ALWAYS	ALWAYS	<User Name>		
Content Creator's Identification Code Sequence	(0070,0086)	GENERATED	ALWAYS	ALWAYS			
>Person Identification Code Sequence	(0040,1101)	GENERATED	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	CONFIGURATION	ALWAYS	ALWAYS	<User ID>		
>>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	AGFA		
>>Code Meaning	(0008,0104)	CONFIGURATION	ALWAYS	ALWAYS	<User ID>		

Table A-21 Presentation State Relationship Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Referenced Series Sequence	(0008,1115)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Series Instance UID	(0020,000E)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Referenced Image Sequence	(0008,1140)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced Frame Number	(0008,1160)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Multiframe	

Table A-22 Presentation State Shutter Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shutter Presentation Value	(0018,1622)	GENERATED	CONDITIONAL	ALWAYS		Shutter present	

Table A-23 Display Shutter Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shutter Shape	(0018,1600)	FIXED	ALWAYS	ALWAYS	RECTANGULAR		For Rectangular Shutter outside (collimated)
Shutter Left Vertical Edge	(0018,1602)	GENERATED	ALWAYS	ALWAYS			
Shutter Right Vertical Edge	(0018,1604)	GENERATED	ALWAYS	ALWAYS			
Shutter Upper Horizontal Edge	(0018,1606)	GENERATED	ALWAYS	ALWAYS			
Shutter Lower Horizontal Edge	(0018,1608)	GENERATED	ALWAYS	ALWAYS			
Shutter Presentation Value	(0018,1622)	FIXED	ALWAYS	ALWAYS	0		

Table A-24 Bitmap Display Shutter Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shutter Shape	(0018,1600)	FIXED	ALWAYS	ALWAYS	BITMAP		For Ellipse Shutter and Rectangular Shutter inside (filled in)

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shutter Overlay Group	(0018,1623)	GENERATED	ALWAYS	ALWAYS	<60xx>		Reference to the overlay plane Module
Shutter Presentation Value	(0018,1622)	FIXED	ALWAYS	ALWAYS	0		

Table A-25 Overlay Plane Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Overlay Rows	(60xx,0010)	GENERATED	ALWAYS	ALWAYS			
Overlay Columns	(60xx,0011)	GENERATED	ALWAYS	ALWAYS			
Overlay Type	(60xx,0040)	FIXED	ALWAYS	ALWAYS	G		
Overlay Origin	(60xx,0050)	FIXED	ALWAYS	ALWAYS	1\1		
Overlay Bits Allocated	(60xx,0100)	FIXED	ALWAYS	ALWAYS	1		
Overlay Bit Position	(60xx,0102)	FIXED	ALWAYS	ALWAYS	0		
Overlay Data	(60xx,3000)	GENERATED	ALWAYS	ALWAYS			
Overlay Description	(60xx,0022)	FIXED	ALWAYS	ALWAYS	SHUTTER		
Overlay Subtype	(60xx,0045)	FIXED	ALWAYS	ALWAYS	Automated		
Overlay Label	(60xx,1500)	FIXED	ALWAYS	ALWAYS	SHUTTER		

Table A-26 Displayed Area Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Displayed Area Selection Sequence	(0070,005A)	GENERATED	ALWAYS	ALWAYS			
>Referenced Image Sequence	(0008,1140)	GENERATED	ALWAYS	ALWAYS			
>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced Frame Number	(0008,1160)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Multiframe	
>Displayed Area Top Left Hand Corner	(0070,0052)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Displayed Area Bottom Right Hand Corner	(0070,0053)	GENERATED	ALWAYS	ALWAYS			
>Presentation Size Mode	(0070,0100)	GENERATED	ALWAYS	ALWAYS			
>Presentation Pixel Spacing	(0070,0101)	GENERATED	ALWAYS	ALWAYS			
>Presentation Pixel Aspect Ratio	(0070,0102)	GENERATED	CONDITIONAL	ALWAYS		Ratio not equal to 1	
>Presentation Pixel Magnification Ratio	(0070,0103)	GENERATED	CONDITIONAL	ALWAYS		Presentation Size mode: MAGNIFY	

Table A-27 Graphic Annotation Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Graphic Annotation Sequence	(0070,0001)	GENERATED	CONDITIONAL	ALWAYS		Annotations	
>Referenced Image Sequence	(0008,1140)	GENERATED	ALWAYS	ALWAYS			
>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced Frame Number	(0008,1160)	SRC_INSTANCE	CONDITIONAL	ALWAYS			
>Graphic Layer	(0070,0002)	FIXED	ALWAYS	ALWAYS	CUSTOM		When modifying external GSPS it could be a different value
>Text Object Sequence	(0070,0008)	GENERATED	CONDITIONAL	ALWAYS		Text	
>>Bounding Box Annotation Units	(0070,0003)	FIXED	ALWAYS	ALWAYS	PIXEL		
>>Anchor Point Annotation Units	(0070,0004)	FIXED	ALWAYS	ALWAYS	PIXEL		
>>Unformatted Text Value	(0070,0006)	GENERATED; USER	ALWAYS	ALWAYS			user Input or generated from graphic

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
							object properties
>>Bounding Box Text Horizontal Justification	(0070,0012)	USER	ALWAYS	ALWAYS	[LEFT; RIGHT; CENTER]		
>>Anchor Point	(0070,0014)	GENERATED	ALWAYS	ALWAYS			
>>Anchor Point Visibility	(0070,0015)	GENERATED	CONDITIONAL	ALWAYS			
>>Compound Graphic Instance ID	(0070,0226)	GENERATED	ALWAYS	ALWAYS			Will be used in (0070,0209)
>Graphic Object Sequence	(0070,0009)	GENERATED	CONDITIONAL	ALWAYS		Graphics	
>>Graphic Annotation Units	(0070,0005)	FIXED	ALWAYS	ALWAYS	PIXEL		
>>Graphic Dimensions	(0070,0020)	FIXED	ALWAYS	ALWAYS	2		
>>Number of Graphic Points	(0070,0021)	GENERATED	ALWAYS	ALWAYS			Depends on the graphic drawn by the user
>> Graphic Data	(0070,0022)	GENERATED	ALWAYS	ALWAYS			
>>Graphic Type	(0070,0023)	GENERATED	ALWAYS	ALWAYS	[CIRCLE; ELLIPSE; POLYLINE; INTERPOLATED]		Depends on the graphic drawn by the user
>>Graphic Filled	(0070,0024)	GENERATED; USER	CONDITIONAL	ALWAYS	[Y; N]	Closed graphic	User may choose to fill in shutter
>>Compound Graphic Instance ID	(0070,0226)	GENERATED	ALWAYS	ALWAYS			Will be used in (0070,0209)
>Compound Graphic Sequence	(0070,0209)	GENERATED	ALWAYS	ALWAYS			Sequence for private use. Useless for external systems

Table A-28 Spatial Transformation Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Rotation	(0070,0042)	USER	ALWAYS	ALWAYS	[270; 180; 90; 0]		
Image Horizontal Flip	(0070,0041)	USER	ALWAYS	ALWAYS	[Y; N]		

Table A-29 Graphic Layer Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Graphic Layer Sequence	(0070,0060)	GENERATED	CONDITIONAL	ALWAYS		Graphic / Annotation / Shutter	
>Graphic Layer	(0070,0002)	GENERATED	ALWAYS	ALWAYS	SHUTTER	Shutter present	
					CUSTOM	(0070,0001) sequence present	
>Graphic Layer Order	(0070,0062)	GENERATED	ALWAYS	ALWAYS			
>Graphic Layer Recommended Display Grayscale Value	(0070,0066)	GENERATED	ALWAYS	ALWAYS			
>Graphic Layer Recommended Display RGB Value	(0070,0067)				0\0\0	Shutter	Retired. Shall be replaced by (0070,0401) EI still supports it
					<R>\<G>\<B> From 0000H (black) to FFFFH (white)		
>Graphic Layer Recommended Display CIELab Value	(0070,0401)	N/A	N/A	N/A			Not supported WIP
>Graphic Layer Description	(0070,0068)	GENERATED	ALWAYS	ALWAYS			

Table A-30 Modality LUT Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Rescale Intercept	(0028,1052)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
Rescale Slope	(0028,1053)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
Rescale Type	(0028,3000)	SRC_INSTANCE	SRC_COPY	SRC_COPY			

Table A-31 Softcopy VOI LUT Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Softcopy VOI LUT Sequence	(0028,3110)	GENERATED	ALWAYS	ALWAYS			
>Referenced Image Sequence	(0008,1140)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced Frame Number	(0008,1160)	SRC_INSTANCE	CONDITIONAL				
>VOI LUT Sequence	(0028,3010)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Source image contains a VOI LUT Sequence	
>>LUT Descriptor	(0028,3002)	GENERATED	ALWAYS	ALWAYS			
>>LUT Data	(0028,3006)	GENERATED	ALWAYS	ALWAYS			
>Window Center	(0028,1050)	GENERATED SRC_INSTANCE	CONDITIONAL	ALWAYS		Source image contains WC or generated	
>Window Width	(0028,1051)	GENERATED; SRC_INSTANCE	CONDITIONAL	ALWAYS		Source image contains WW or generated	
> WindowCenter WidthExplanation	(0028,1055)	SRC_INSTANCE	SRC_COPY	SRC_COPY			

Table A-32 Softcopy Presentation LUT Module for GSPS IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Presentation LUT Shape	(2050,0020)	GENERATED	ALWAYS	ALWAYS	IDENTITY; INVERSE		

A.2.2 Grayscale Softcopy Presentation State IOD Functional Group Macros - NA

N/A

A.2.3 Grayscale Softcopy Presentation State IOD Private Modules

Private modules / tags presents in the created Presentation state with private creator: (0071,xx10) AgilityOverlay are for internal use only and documented in internal AGFA HealthCare documentation

A.2.4 Grayscale Softcopy Presentation State IOD Coded Values – N/A

Error! Reference source not found.N/A

A.3 Segmentation IOD - WIP

In a future iteration of Enterprise Imaging the Core server will generate Segmentation objects (SOP Class 1.2.840.10008.5.1.4.1.1.66.4)

Table A-33 defines the structure of Segmentation IOD.

Table A-33 Segmentation IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
	Segmentation Series	ALWAYS		Table A-35
Frame of Reference	Frame of Reference	ALWAYS		Table A-5
Equipment	General Equipment	ALWAYS		Table A-6
	Enhanced General Equipment	ALWAYS		Table A-36
Image	General Image	ALWAYS		Table A-8
	Image Pixel	ALWAYS		Table A-9
	Segmentation Image	ALWAYS		Table A-37**Table A-47**
	Multi-Frame Functional Groups	ALWAYS		Table A-10
	Multi-Frame Dimension	ALWAYS		Table A-11
	SOP Common	ALWAYS		Table A-12
	Private Inner Mask Module	ALWAYS		Table A-39

Table A-34 lists the Functional group macros used in Segmentation IOD. The "Usage" column defines whether a Macro is used as a shared Macro, on a per frame base or whether depending on the acquisition context can be used in both contexts. The following Values are supported:

- PER_FRAME: The macro is used on a per frame basis, the Attributes are included in the Per-frame Functional Groups Sequence (5200,9230)
- SHARED: The macro is shared across all frames; the Attributes are included in the Shared Functional Groups Sequence (5200,9229)
- CONTEXT_DEPENDENT: Depending on the acquisition context the macro can either be used on a per frame basis or be shared across all frames.

Table A-34 Functional Group Macros used in Segmentation IOD

Functional Group Macro	Presence	Condition	Usage	Reference
Pixel Measures	ALWAYS		SHARED	Table A-13
Plane Position (Patient)	ALWAYS		PER_FRAME	Table A-15
Plane Orientation (Patient)	ALWAYS		SHARED	Table A-16
Frame Content	ALWAYS		PER_FRAME	Table A-14
Segmentation	ALWAYS		SHARED	Table A-38

A.3.1 Segmentation IOD Specific Modules

The following tables list Modules and Attributes specific for Segmentation IOD:

Table A-35 Segmentation Series Module for Segmentation IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SEG		
Series Number	(0020,011)	FIXED	ALWAYS	ALWAYS	1		

Table A-36 Enhanced General Equipment Module for Segmentation IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	AGFA		
Manufacturer Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	IMPAX AGILITY GENRAD		
Device Serial Number	(0018,1000)	FIXED	ALWAYS	EMPTY			
Software Versions	(0018,1020)	GENERATED	ALWAYS	ALWAYS	V1		

Table A-37 Segmentation Image Module for Segmentation

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	PRIMARY\DERIVED		
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	0		
Content Label	(0070,0080)	GENERATED	ALWAYS	ALWAYS	[__GeneratedMaskID_1_1767600223	16 bytes max	
Content Description	(0070,0081)	GENERATED	ALWAYS	ALWAYS	__GeneratedMaskID_<maskidentifier>		
Content Creator's Name	(0070,0084)	GENERATED			agfa/ei/segmentation		
Samples Per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	1		
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	MONOCHROME2		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0		
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	1	Segmentation Type (0062,0001) is BINARY	
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	1		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	0		
Lossy Image Compression	(0028,2110)	FIXED	ALWAYS	ALWAYS	00		
Segmentation Type	(0062,0001)	FIXED	ALWAYS	ALWAYS	BINARY		FRACTIONAL not supported
Segment Sequence	(0062,0002)	FIXED	ALWAYS	ALWAYS			
>Segment Number	(0062,0004)	FIXED	ALWAYS	ALWAYS	1		
>Segment Label	(0062,0005)	GENERATED	ALWAYS	ALWAYS			
>Segment Description	(0062,0006)	GENERATED	ALWAYS	ALWAYS			
>Segment Algorithm Type	(0062,0008)	FIXED	ALWAYS	ALWAYS	MANUAL		
>Anatomic Region Sequence	(0008,2218)	ALWAYS	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	AGFA000		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>Coding Scheme Designator	(0008,0102)				agfa/ei/segmentation	Shall be 16 characters max	
>>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Default		
>Segmented Property Category Code Sequence	(0062,0003)	FIXED	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	AGFA000		
>>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	agfa/ei/segmentation		Shall be 16 characters max
>>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Default		
>Segmented Property Type Code Sequence	(0062,000F)	FIXED	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	AGFA000		
>>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	agfa/ei/segmentation		Shall be 16 characters max
>>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Default		
>Segment Algorithm Name	(0062,0009)	FIXED	ALWAYS	ALWAYS	Manual segmentation		

A.3.2 Segmentation Functional Group Macro

The table below list functional group macros and Attributes for Segmentation IOD:

Note that Only the ones which are not part of the Common Functional group macro (section A.1.2) are listed here:

Table A-38 Segmentation Functional Group Macro for Segmentation IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Segment Identification Sequence	(0062,000A)	GENERATED	ALWAYS	ALWAYS			
>Referenced Segment Number	(0062,000B)	FIXED	ALWAYS	ALWAYS	1		

A.3.3 Segmentation IOD Private Modules

Table A-39 lists private Modules and Attributes for Segmentation IOD.

Table A-39 Private Module for Segmentation IOD

Attribute Name	Tag	VR	VM	Identifiable Information	Presence of Attribute	Presence of Value	Value	Conditions	Description
Private Creator	(0073,00xx)	LO	1		ALWAYS	ALWAYS	agfa/ei/segmentation		inner mask properties which are used by ImageArea
Mask Is Visible	(0073,xx14)	CS	1	SAFE	ALWAYS	ALWAYS	0;1		
Mask is Filled	(0073,xx15)	CS	1	SAFE	ALWAYS	ALWAYS	0;1		
Mask Has Measurements	(0073,xx16)	CS	1	SAFE	ALWAYS	ALWAYS	0;1		
Mask Is Background	(0073,xx17)	CS	1	SAFE	ALWAYS	ALWAYS	0;1		

A.3.4 Segmentation IOD Coded Values – N/A

N/A

A.4 Key Object Selection Document IOD

The **Key Object Selection Documents** (SOP class 1.2.840.10008.5.1.4.1.1.88.59) are created in the following cases:

- The user of the Diagnostic / Acquisition desktop flag image(s) as Key image(s)
- The user of the Diagnostic / Acquisition desktop saves a Presentation State. Depending on the configuration, image(s) for which the Presentation State(s) apply is marked as key image(s).
- A QC operation (Study Fixup/merge/split/segment/delete) performed by the user in the diagnostic/Acquisition Desktop triggers the creation of a KOSD Rejection Note according to the IHE IOCM profile

Table A-40 defines the structure of Key Object Selection Document (KOSD) IOD.

Table A-40 Key Object Selection Document IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-4

IE	Module Name	Presence (Module)	Condition	Reference
Series	Key Object Document Series	ALWAYS		Table A-41
Equipment	General Equipment	ALWAYS		Table A-6
SR Document	Key Object Document	ALWAYS		Table A-42Table A-9
	SR Document Content	ALWAYS		Table A-43
	SOP Common	ALWAYS		Table A-12

A.4.1 Key Object Selection Document Specific Modules

The following tables list Modules and Attributes specific for Key Object Selection Document (KOSD) IOD:

Table A-41 Key Object Document Series Module for KOSD IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	KO		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS			
Series Number	(0020,011)	GENERATED	ALWAYS	ALWAYS			Rejection note series number is always 999
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Series Description	(0008,103E)	FIXED	CONDITIONAL	ALWAYS	Rejection Note	Only present for KOSD Rejection Notes	
Referenced Performed Procedure Step Sequence	(0008,1111)	EMPTY	ALWAYS	EMPTY			

Table A-42 Key Object Document Module for KOSD IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS			
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Current Requested Procedure Evidence Sequence	(0040,A375)	GENERATED	ALWAYS	ALWAYS			
>Study Instance UID	(0020,000D)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Referenced Series Sequence	(0008,1115)	GENERATED	ALWAYS	ALWAYS	1 or more items		
>>Series Instance UID	(0020,000E)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Sequence	(0008,1199)	GENERATED	ALWAYS	ALWAYS			
>>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>>Referenced Frame Number	(0008,1160)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Not present for KOSD Rejection Note	

Table A-43 SR Document Content Module for KOSD IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Value Type	(0040,A040)	FIXED	ALWAYS	ALWAYS	CONTAINER		
Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS	See Section A.4.4		
> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	See Section A.4.4		
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>Code Meaning	(0008,0104)	GENERATED	ALWAYS		See Section A.4.4		
Continuity Of Content	(0040,A050)	FIXED	ALWAYS	ALWAYS	SEPARATE		
Content Template Sequence	(0040,A504)	GENERATED	ALWAYS	ALWAYS	1 item		
>Mapping Resource	(0008,0105)	FIXED	ALWAYS	ALWAYS	DMR		
>Template Identifier	(0040,DB00)	FIXED	ALWAYS	ALWAYS	2010		
Content Sequence	(0040,A730)	GENERATED	ALWAYS	ALWAYS	One or more items		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Relationship Type	(0040,A010)	GENERATED	ALWAYS	ALWAYS	[CONTAINS; HAS OBS CONTEXT; HAS CONTEXT MOD]		
>Value Type	(0040,A040)	GENERATED	ALWAYS	ALWAYS	[CODE; PNAME;TEXT; IMAGE;COMPOSITE]		
>Concept Name Code Sequence	(0040,A043)	GENERATED	CONDITIONAL	ALWAYS	1 item	Value type is CODE, PNAME or TEXT	
>> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS			
>>Coding Scheme Designator	(0008,0102)	GENERATED	ALWAYS	ALWAYS	DCM		
>>Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS			
>Text Value	(0040,A160)	USER	CONDITIONAL	ALWAYS	<free text>	Value Type is TEXT	
>Person Name	(0040,A123)	CONFIGURATION	CONDITIONAL	ALWAYS	<USER ID>	Value Type is PNAME	
>Referenced SOP Sequence	(0008,1199)	GENERATED	CONDITIONAL	ALWAYS	1 or more items	Value Type is IMAGE or COMPOSITE	
>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			

A.4.2 Key Object Selection Document IOD Functional Group Macro – N/A

N/A

A.4.3 Key Object Selection Document Private Modules – N/A

N/A

A.4.4 Key Object Selection IOD Coded Values

Table A-44 lists Coded Values referenced from the "Value" column of the tables above for Key Object Selection IOD:

Table A-44 Values and Code Sets for Key Object Selection IOD

Attribute Name	Tag	Value/Code	Condition	Comments
Concept Name Code Sequence	(0040,A043)	Sequence		
>Code Value	(0008,0100)	113037	QC Study Split QC Study Segment	
>Code Meaning	(0008,0104)	Rejected for Patient Safety Reasons		
>Code Value	(0008,0100)	113038	QC Study Merge QC Study Fixup (when configured to keep SUID of the target requested Procedure)	
>Code Meaning	(0008,0104)	Incorrect Modality Worklist Entry		
>Code Value	(0008,0100)	113039	QC Study Delete QC Study Fixup (When configured to keep the SUID of the source study)	
>Code Meaning	(0008,0104)	Data Retention Policy Expired		
>Code Value	(0008,0100)	113000	KOSD created because of a GSPS User select “Of Interest” to mark the image(s)	
>Code Meaning	(0008,0104)	Of Interest		
> Code Value	(0008,0100)	113020	User selects “For Report Attachment” to mark the image(s)	
>Code Meaning	(0008,0104)	For Report Attachment		
>Code Value	(0008,0100)	113018	User selects “For Printing” to mark the image(s)	
>Code Meaning	(0008,0104)	For Printing		
>Code Value	(0008,0100)	113002	User selects “For Referring Provider” to mark the image(s)	
>Code Meaning	(0008,0104)	For Referring Provider		
>Code Value	(0008,0100)	113003	User selects “For Surgery” to mark the image(s)	
>Code Meaning	(0008,0104)	For Surgery		
>Code Value	(0008,0100)	113006	User selects “For Therapy” to mark the image(s)	
>Code Meaning	(0008,0104)	For Therapy		
>Code Value	(0008,0100)	113007	User selects “For Patient” to mark the image(s)	
>Code Meaning	(0008,0104)	For Patient		
>Code Value	(0008,0100)	113004	User selects “For Teaching” to mark the image(s)	
>Code Meaning	(0008,0104)	For Teaching		
>Code Value	(0008,0100)	113005	User selects “For Conference” to mark the image(s)	
>Code Meaning	(0008,0104)	For Conference		
>Code Value	(0008,0100)	113008	User selects “For Peer Review” to mark the image(s)	
>Code Meaning	(0008,0104)	For Peer Review		
>Code Value	(0008,0100)	113009	User selects “For Research” to mark the image(s)	
>Code Meaning	(0008,0104)	For Research		

A.5 Encapsulated PDF IOD

Core server can generate a PDF document based on a validated report of a study and all of its validated addenda, and store it with the study as a **DICOM Encapsulated PDF**, so that it can be transferred with the study through DICOM interfaces. The DICOM-encapsulated version of the report will either be:

- DICOM Encapsulated PDF of a validated final (or addended) plain text report
- DICOM Encapsulated PDF of a validated final (or addended) PDF report

Web Server (XERO Capture) can generate a DICOM encapsulated PDF from a PDF document and store it with the selected / Created study to the **Core Server**

Table A-45 defines the structure of the Encapsulated PDF IOD (SOP Class 1.2.840.10008.5.1.4.1.1.104.1).

Table A-45 Encapsulated PDF IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
Series	Encapsulated Document Series	ALWAYS		Table A-46
Equipment	General Equipment	ALWAYS		Table A-6
	SC Equipment	ALWAYS		Table A-47
Acquisition	General Acquisition	CONDITIONAL	XERO Capture	Table A-7
Encapsulated Document	Encapsulated Document	ALWAYS		Table A-48
	SOP Common	ALWAYS		Table A-12
	Private Report Module	CONDITIONAL	Core Server	Table A-49

A.5.1 Encapsulated PDF IOD Specific Modules

The following tables list Modules and Attributes specific for Encapsulated IOD.

Table A-46 Encapsulated Document Series Module for Encapsulated PDF IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	DOC	Core Server	
					SR	XERO Capture	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS			
Series Number	(0020,011)	FIXED	ALWAYS	ALWAYS	999		

Table A-47 SC Equipment Module for Encapsulated PDF IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Conversion Type	(0008,0064)	FIXED	ALWAYS	ALWAYS	SD		

Table A-48 Encapsulated Document Module for Encapsulated PDF IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	1		
Content Date	(0008,0023)	SRC_INSTANCE	ALWAYS	ALWAYS			Last update date of the report version for this particular DICOM pdf
Content time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			Last update time of the report version for this particular DICOM pdf
Acquisition Date Time	(0008,002A)	EMPTY	ALWAYS	EMPTY			
Burned In Annotation	(0028,0301)	FIXED	ALWAYS	ALWAYS	YES		
Document Title	(0042,0010)	FIXED	ALWAYS	ALWAYS	REPORT		
Concept Name Code Sequence	(0040,A043)	EMPTY	ALWAYS	EMPTY			
Verification Flag	(0040,A493)	FIXED	ALWAYS	ALWAYS	VERIFIED		
MIME Type of Encapsulated Document	(0042,0012)	FIXED	ALWAYS	ALWAYS	application/ pdf		
Encapsulated Document	(0042,0011)	GENERATED	ALWAYS	ALWAYS			
Encapsulated Document Length	(0042,0015)	GENERATED	ALWAYS	ALWAYS			

A.5.2 Encapsulated PDF IOD Functional Group Macro – N/A

N/A

A.5.3 Encapsulated PDF IOD Private Modules

Table A-49 lists private Modules and Attributes for Encapsulated PDF IOD.

Table A-49 Private Module for Encapsulated PDF IOD

Attribute Name	Tag	VR	VM	Identifiable Information	Presence of Attribute	Presence of Value	Value	Conditions	Description
Private Creator	(0059,00xx)	LO	1		ALWAYS	ALWAYS	AGFA_REPORT	Core Server	
Special Treatment	(0059,xx01)	SH	1	SAFE	ALWAYS	ALWAYS	Y	Core Server	Used for workflow / routing rules when receiving the encapsulated PDF

A.5.4 Encapsulated PDF IOD Coded Values – N/A

N/A

A.6 General Audio Waveform IOD

Web Server (XERO Capture) can generate a **General Audio Waveform IOD** (SOP Class 1.2.840.10008.5.1.4.1.1.9.4.2) from an audio file of various format such as MP3, WAV, FLAC, AIFF and store it with the selected / created study to the **Core Server.**

Table A-50 defines the structure of the General Audio Waveform IOD

Table A-50 General Audio Waveform IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
Equipment	General Equipment	ALWAYS		Table A-6
Waveform	Waveform Identification	ALWAYS		Table A-51
	Waveform	ALWAYS		Table A-52
	Acquisition Context	ALWAYS		Table A-53
	SOP Common	ALWAYS		Table A-12

A.6.1 General Audio Waveform IOD Specific Modules

The tables below list modules and Attributes used in the General Audio Waveform IOD:

Table A-51 Waveform Identification Module used in General Audio Waveform IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS			

Table A-52 Waveform Module used in General Audio Waveform IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Waveform Sequence	(5400,0100)	GENERATED	ALWAYS	ALWAYS	Sequence		
>Waveform Originality	(003A,0004)	FIXED	ALWAYS	ALWAYS	ORIGINAL		
>Number of Waveform Channels	(003A,0005)	FIXED	ALWAYS	ALWAYS	1		
>Number of Waveform Samples	(003A,0010)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Sampling Frequency	(003A,001A)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Unknown	(003A,0100)	FIXED	ALWAYS	ALWAYS	1		
>Channel Definition Sequence	(003A,0200)	GENERATED	ALWAYS	ALWAYS	Sequence		
>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	109110		
>>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Voice		
>Waveform Bits Allocated	(5400,1004)	FIXED	ALWAYS	ALWAYS	16		
>Waveform Sample Interpretation	(5400,1006)	FIXED	ALWAYS	ALWAYS	SS		
>Waveform Data	5400,1010	SRC_INSTANCE	ALWAYS	ALWAYS			

Table A-53 Acquisition Context Module used in General Audio Waveform IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Context Sequence	(0040,0555)	GENERATED	ALWAYS	ALWAYS	Sequence		
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	109110		
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Voice		

A.6.2 General Audio Waveform IOD Functional Group Macros - N/A

N/A

A.6.3 General Audio Waveform IOD Private Modules – N/A

N/A

A.6.4 General Audio Waveform IOD Coded Values – N/A

N/A

A.7 Raw Data IOD

Web Server (XERO Capture) can encapsulate document of any type such as word, Excel, powerpoint etc…(except PDF) into a **Raw Data IOD** (SOP Class 1.2.840.10008.5.1.4.1.1.66) and store it with the selected / created study to the **Core Server.**

The standard specifies that private tags are required to store the Raw Data. However, as the document is encapsulated, the **Encapsulated Document module** is used instead of the Raw Data module to avoid creating unnecessary private tags

Table A-54**Table A-50** defines the structure of the General Audio Waveform IOD

Table A-54 Raw Data IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study Module	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
Equipment	General Equipment	ALWAYS		Table A-6
Acquisition	General Acquisition	ALWAYS		Table A-7
Encapsulated Document	Encapsulated Document	ALWAYS		Table A-55
	SOP Common	ALWAYS		Table A-12

A.7.1 Raw Data IOD Specific Modules

The tables below list specific modules and Attributes used in the Raw Data IOD:

Table A-55 Encapsulated Document Module used in Raw Data IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	1		
Burned In Annotation	(0028,0301)	FIXED	ALWAYS	ALWAYS	YES		
Document Title	(0042,0010)	SRC_INSTANCE	ALWAYS	ALWAYS			
Concept Name Code Sequence	(0040,A043)	FIXED	ALWAYS	ALWAYS			
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	ImportedRaw		
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	AGFA		
>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Encapsulated Raw		
MIME Type of Encapsulated Document	(0042,0012)	GENERATED	ALWAYS	ALWAYS			
Encapsulated Document	(0042,0011)	GENERATED	ALWAYS	ALWAYS			
Encapsulated Document Length	(0042,0015)	GENERATED	ALWAYS	ALWAYS			
Content Sequence	(0040,A730)	GENERATED	ALWAYS	ALWAYS	Sequence contains 3 items		

A.7.2 Raw Data IOD Functional Group Macros - N/A

N/A

A.7.3 Raw Data IOD Private Modules – N/A

N/A

A.7.4 Raw Data IOD Coded Values – N/A

N/A

A.8 Video Photographic Image IOD

Web Server (XERO Capture) can generate **Video Photographic Image IOD** (SOP Class 1.2.840.10008.5.1.4.1.1.77.1.4.1) from a Video file of various format such as AVI, MOV, MPG, MP4, WMV and store it with the selected / created study to the **Core Server.**

Table A-56 defines the structure of the Video Photographic Image IOD

Table A-56 Video Photographic Image IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
Equipment	General Equipment	ALWAYS		Table A-6
Acquisition	General Acquisition	ALWAYS		Table A-7
Image	General Image	ALWAYS		Table A-8
	Cine	ALWAYS		Table **A-57**
	Multi-frame	ALWAYS		Table A-58
	Image Pixel	ALWAYS		Table A-9
	Acquisition Context	ALWAYS		Table A-59
	VL Image	ALWAYS		Table A-60
	SOP Common	ALWAYS		Table A-12

A.8.1 Video Photographic Image IOD Specific Modules

The tables below list specific modules and Attributes used in the Video Photographic Image IOD:

Table A-57 Cine Module used in Video Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame Time	(0018,1063)	SRC_INSTANCE	ALWAYS	ALWAYS			

Table A-58 Multi-frame Module used in Video Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Number of Frames	(0028,0008)	SRC_INSTANCE	ALWAYS	ALWAYS			
Frame Increment Pointer	(0028,0009)	FIXED	ALWAYS	ALWAYS	0x00181063		

Table A-59 Acquisition Context Module used in Video Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Context Sequence	(0040,0555)	FIXED	ALWAYS	EMPTY	Sequence		Always empty

Table A-60 VL Image Module used in Video Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	ORIGINAL\ PRIMARY		
Lossy Image Compression	(0028,2110)	FIXED	ALWAYS	ALWAYS	01		

A.8.2 Video Photographic Image IOD Functional Group Macros - N/A

N/A

A.8.3 Video Photographic Image IOD Private Modules – N/A

N/A

A.8.4 Video Photographic Image IOD Coded Values – N/A

N/A

A.9 VL Photographic Image IOD

Web Server (XERO Capture) can generate **VL Photographic Image IOD** (SOP Class 1.2.840.10008.5.1.4.1.1.77.1.4) from a JPG or PNG Image file and store it with the selected / created study to the **Core Server.**

Table A-61 defines the structure of the VL Photographic Image IOD

Table A-61 VL Photographic Image IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-1
Study	General Study	ALWAYS		Table A-2
	Patient Study	CONDITIONAL	SRC_COPY	Table A-3
Series	General Series	ALWAYS		Table A-4
Equipment	General Equipment	ALWAYS		Table A-6
Acquisition	General Acquisition	ALWAYS		Table A-7
Image	General Image	ALWAYS		Table A-8
	Image Pixel	ALWAYS		Table A-9
	Acquisition Context	ALWAYS		Table A-62
	VL Image	ALWAYS		Table A-63
	SOP Common	ALWAYS		Table A-12

A.9.1 VL Photographic Image IOD Specific Modules

The tables below list specific modules and Attributes used in the VL Photographic Image IOD:

Table A-62 Acquisition Context Module used in VL Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Context Sequence	(0040,0555)	FIXED	ALWAYS	EMPTY	Sequence		Always empty

Table A-63 VL Image Module used in VL Photographic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	ORIGINAL\PRIMARY		
Photometric Interpretation	(0008,0004)	FIXED	ALWAYS	ALWAYS	YBR_FULL_422	JPG image	
					RGB	PNG image	
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	8		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	8		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	7		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0		
Samples per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	3		
Planar Configuration	(0028,0006)	FIXED	ALWAYS	ALWAYS	0		
Lossy Image Compression	(0028,2110)	FIXED	ALWAYS	ALWAYS	00		

A.9.2 VL Photographic Image IOD Functional Group Macros - N/A

N/A

A.9.3 VL Photographic Image IOD Private Modules – N/A

N/A

A.9.4 VL Photographic Image IOD Coded Values – N/A

N/A

A.10 Basic Directory

Table A-64 defines the structure of the Basic Directory IOD.

Table A-64 Basic Directory IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
File Set Identification Module							
File-set ID	(0004,1130)	GENERATED	ALWAYS	ALWAYS	1	Core Server	
					<StudyIUID>	Web Server	
Directory Information Module							
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	GENERATED	ALWAYS	ALWAYS			
File-set Consistency Flag	(0004,1212)	FIXED	ALWAYS	ALWAYS	0		
Directory Record Sequence	(0004,1220)	GENERATED	ALWAYS	ALWAYS			
>Offset of the Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			
>Record In-use Flag	(0004,1410)	FIXED	ALWAYS	ALWAYS	FFFF (65535)		
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			
>Directory Record Type	(0004,1430)	GENERATED	ALWAYS	ALWAYS	PATIENT; STUDY; SERIES; IMAGE; SR DOCUMENT …		See the full list of values in PS3 Table F3.3
>Referenced File ID	(0004,1500)	GENERATED	CONDITIONAL	ALWAYS		Record type is a DICOM Instance	
>Referenced SOP Class UID in File	(0004,1510)	SRC_INSTANCE	CONDITIONAL	ALWAYS	<SOPClassUID>	Record type is a DICOM Instance	
>Referenced SOP Instance UID in File	(0004,1511)	SRC_INSTANCE	CONDITIONAL	ALWAYS	<SOPInstanceUID>	Record type is a DICOM Instance	
>Referenced Transfer Syntax UID in File	(0004,1512)	SRC_INSTANCE	CONDITIONAL	ALWAYS	<TSUID>	Record type is a DICOM Instance	
PATIENT Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Patient's Name	(0010,0010)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Patient ID	(0010,0020)	SRC_INSTANCE	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
>Issuer of Patient ID	(0010,0021)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Patient's Birth Date	(0010,0030)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Patient's Sex	(0010,0040)	SRC_INSTANCE	ALWAYS	ALWAYS			Web Server only
STUDY Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Study Date	(0008,0020)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Study Time	(0008,0030)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Study Description	(0008,1030)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Study Instance UID	(0020,000D)	SRC_INSTANCE	ALWAYS	ALWAYS	<StudyIUID>		
>Study ID	(0020,0010)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Accession Number	(0008,0050)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Modality	(0008,0060)	SRC_INSTANCE	ALWAYS	ALWAYS			Web Server Only
>Modalities in Study	(0008,0061)	SRC_INSTANCE	ALWAYS	ALWAYS			Core Server
				EMPTY			Web Server
SERIES Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Modality	(0008,0060)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Series Instance UID	(0020,000E)	SRC_INSTANCE	ALWAYS	ALWAYS	<SeriesIUID>		
>Series Number	(0020,0011)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Series Description	(0008,103e)	SRC_INSTANCE	ALWAYS	SRC_COPY			Web Server Only
>Performing Physician's Name	(0008,1050)	SRC_INSTANCE	ALWAYS	SRC_COPY			Web Server Only
IMAGE Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Instance Number	(0020,0013)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Acquisition Date	(0028,0022)	SRC_INSTANCE	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
>Acquisition Time	(0028,0004)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Image Position Patient	(0020,0032)	SRC_ INSTANCE	SRC_COPY	SRC_COPY			
>Image Orientation Patient	(0020,0037)	SRC_ INSTANCE	SRC_COPY	SRC_COPY			
>Frame of Reference UID	(0020,0052)	SRC_ INSTANCE	SRC_COPY	SRC_COPY			
>Rows	(0028,0010)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Columns	(0028,0011)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Pixel Spacing	(0028,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
Presentation Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Presentation Creation Date	(0070,0082)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Presentation Creation Time	(0070,0083)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Instance Number	(0020,0013)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Label	(0070,0080)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Description	(0070,0081)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Content Creator's Name	(0070,0084)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Referenced Series Sequence	(0008,1115)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Series Instance UID	(0020,000E)	SRC_INSTANCE	ALWAYS	ALWAYS	<SeriesIUID>		
>>Referenced Image Sequence	(0008,1140)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>>Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>>Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS	<SOPInstanceUID>		
SR Document Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Instance Number	(0020,0013)	SRC_INSTANCE	ALWAYS	SRC_COPY			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
>Completion Flag	(0040, A491)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Verification Flag	(0040, A493)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Date	(0008,0023)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Time	(0008,0033)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Verification DateTime	(0040,A030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Concept Name Code Sequence	(0040,A043)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Coding Scheme Designator	(0008,0102)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Code Meaning	(0008,1004)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Content Sequence	0040,A730	SRC_INSTANCE	SRC_COPY	SRC_COPY	1 or more items		
Key Object Document Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Instance Number	(0020,0013)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Content Date	(0008,0023)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Time	(0008,0033)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Concept Name Code Sequence	(0040,A043)	SRC_INSTANCE	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Coding Scheme Designator	(0008,0102)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>>Code Meaning	(0008,1004)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Content Sequence	0040,A730	SRC_INSTANCE	SRC_COPY	SRC_COPY	1 or more items		
Encapsulated Document Keys							
>Specific Character Set	(0008,0005)	GENERATED	ALWAYS	ALWAYS			
>Instance Number	(0020,0013)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>Content Date	(0008,0023)	SRC_INSTANCE	ALWAYS	ALWAYS			
>Content Time	(0008,0033)	SRC_INSTANCE	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Condition	Comments
>Document Title	(0042,0010)	SRC_INSTANCE	ALWAYS	SRC_COPY			
>MIME Type of Encapsulated Document	(0042,0012)	SRC_INSTANCE	ALWAYS	ALWAYS			

B Structured Report Content Encoding – N/A

N/A

C Security Details - TBC

TBC

D Mapping of Attributes – TBC

TBC

E Code Set Usage – N/A

N/A